Document No 14031-024-016

PAS 2030: 2012

Improving the energy efficiency of existing buildings –

Specification for installation process, process management and service provision

Editorial Commentary – 2011-09-26.

PAS 2030 is a substantial document (169 text pages) comprised of 11 pages of core requirements applicable to all installation types followed by 26 measure specific annexes each containing additional requirements for one particular type of energy efficiency measure.

All reviewers should therefore review, comment and make recommendation for change if appropriate, in respect of the core requirements. Reviewers may however be selective in their choice of which annexes to review. Some may wish to comment only on those measures with which they are directly involved whilst other may have a more generic interest and decide to review and comment upon all annexes. Whatever the decision the PAS 2030 Steering Group will be pleased to receive your input and to take it into account in its development of the final specification.

Attention is drawn to the fact that in developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently under consideration or in use. For some annexes in this review draft however, this has not proved possible and as a result 12 annexes reflect two distinct approaches, (identified as Version 1 and Version 2 in each case). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for each of those measures, taking account of the expert view submitted during this review.

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Foreword

This draft Publicly Available Specification (PAS) has been prepared by BSI to provide a specification for the installation of energy efficiency measures in existing buildings, particularly where such installation is undertaken within the remit of the United Kingdom Green Deal Financing Mechanism.

The development of this PAS is sponsored by the Department for Energy and Climate Change (DECC).

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to a competent person or persons for whose use it has been produced.

Acknowledgement is given to the following organizations and individuals who assisted with the development of this specification: Association of British Certification Bodies, British Board of Agrement, British Electrotechnical and Allied Manufacturers Association, British Standards Institute Consumer & Public Interest Network, Chartered Institution of Building Services Engineers, Construction Products Association, CITB-Constructionskills, Department of Communities and Local Government, Energy Retailers Association, Federation of Master Builders, Glass and Glazing Federation, Insulated Render and Cladding Association, Kingfisher PLC, National Insulation Association, Royal Institute of British Architects, United Kingdom Accreditation Service, University College London.

Editorial Note: Further organizations to be added from the Steering Group's nominated contact lists

Comments from other parties were also sought by BSI. The expert contributions from all the organizations and individuals consulted in the development this PAS, are gratefully acknowledged.

This draft PAS is not to be regarded as a British Standard, European Standard or International Standard. In the event that this PAS is put forward to form the basis of a full British Standard, European Standard or International Standard, it will be withdrawn.

Presentational conventions

The provisions of this PAS are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall". Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material, e.g. Notes, is presented in italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with this PAS does not in itself confer immunity from legal obligations.

Introduction

This PAS provides a specification for the installation of energy efficiency measures in existing buildings. The PAS achieves this by focusing particularly on the necessary installation processes for the measures, the management of the process that guides their installation and the quality of the service provided to the customer before, during and after the installation. This PAS has been designed to establish a robust, uniformly applicable standard that will assist installers that comply with its requirements in full to demonstrate that their installation processes are capable of providing installation of energy efficiency improvement measures to specification and in accordance with the customer's expectations.

This PAS has been produced to work alongside, but not exclusively in connection with, the Green Deal Financing Mechanism. The Energy Act 2011 is the Coalition Government's flagship policy for improving the energy efficiency of buildings in Great Britain. It is a market framework based on a key principle that some energy efficiency related changes to properties pay for themselves, in effect, through the resulting savings on fuel bills.

The Energy Act 2011 creates a financing mechanism that will allow a range of energy efficiency measures to be installed in both dwellings and non-dwellings at no upfront cost. DECC will be using this PAS to:

set the requirements for the installation of the measure(s) under the Green Deal and

as a good practice benchmark for installations carried out on their flagship policy.

This PAS is primarily intended for the installer of the energy efficiency measures, but other parties may also find it useful (e.g. Green Deal Providers).

Figure 1 – Illustration of the Green Deal structure

NOTE This PAS is being developed to support the implementation of the UK government's Green Deal Scheme. However, since the full structure of the Green Deal has not yet been confirmed, an illustration of how the Green Deal works in practice cannot be included in the PAS at this time.

For the purposes of this PAS, the critical relationship under the Green Deal is that between the Installer and the Green Deal Provider (GDP)

The Installer is responsible to the GDP for ensuring the installation has been performed correctly.

The customer (i.e. property owner, landlord and / or tenant of a building for whom energy efficiency measures are being installed) will be expected to turn to the GDP for information, advice, complaints, recourse or other requirements. There will be no official relationship between the installer and the customer.

1 Scope

This PAS sets out requirements for the installation of energy efficiency measures in existing buildings used for both dwelling and non-dwelling purposes, including those that facilitate the microgeneration of energy for use and/or sale. It is intended for use by any entity undertaking the installation of any products and/ or systems designed to improve the energy efficiency of existing buildings but particularly where those products and systems are to be installed within the remit of the United Kingdom Green Deal Financing Mechanism.

This PAS includes requirements in respect of installation processes, process management and service provision and includes criteria relating to installation methods, equipment and tools, product and material suitability and the training, skills and competence of the people undertaking such installation.

This PAS is constituted of core requirements to be met by any entity claiming conformance with it, supplemented by annexes setting out additional requirements by product category. This PAS requires claims of conformance to be in respect of the core requirements and all annexes relevant to the installation to be undertaken by the claiming entity.

Annexes A to Z provide specific requirements relating to particular energy efficiency improvement measures for application by installers undertaking installation of those measures. These Annexes also include requirements in respect of the provision of information to customers.

Annex AA provides a check list of health and safety considerations relating to construction that may be found relevant to installers.

This PAS does not include requirements relating to the certification of PAS 2030 compliance by independent third parties which subject is covered by PAS 2031: 2012, developed in conjunction with this PAS.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EDITORIAL NOTE: Normative references to be added as required by clause content

3 Terms and definitions

The following terms and definitions are considered indispensible to the understanding and application of this PAS.

3.1
accreditation

Third party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks

3.2
accreditation body

Authoritative body that performs accreditation
NOTE The authority of an accreditation body is generally derived from government

3.3
advice
information specific to individuals and their circumstances that encourages and enables them to take action to improve energy efficiency

3.4
accredited certification body
body assessed and approved by an accreditation body against the requirements of BS EN 45011 to provide conformity attestation within a specified scope of PAS 2030

3.5
competence
having the necessary technical knowledge, skill and experience for the nature of the installation process undertaken and possessing the ability to prevent danger and/or where appropriate injury

3.6
commissioning
advancement of a fixed building service following installation, replacement or alteration of the whole or part of the system, from the state of static completion to working order

3.7
customer
property owner, landlord and / or tenant of a building for whom energy efficiency measures are being installed.

NOTE Attention is drawn to the fact that in this PAS, the term customer refers to the customer of a green deal installation project. As such that customer will have a direct business relationship with a green deal provider (GDP) and not with the installer undertaking the placement of measures in the building of which they are owner, landlord or tenant. In this context, the installer is acting as an agent of the relevant GDP. The Customer could be referred to as the occupier in other green deal related documents.

3.8
energy efficiency measure (EEM)
pre-planned action undertaken to improve the thermal performance of a building by saving or generating energy

3.9
installer
entity undertaking the physical placement of a measure(s) in an existing building

3.10
installation
location and placement of a measure in an existing building

3.11
installation process
entirety of products, methods, constituent tasks, tooling and equipment, specific procedures, training, skills and competence required to install a particular measure

3.12
operative

person employed by the installer to undertake installation tasks as part of the installer's defined installation process

3.13
product
branded materials *Subject to change (Dean Thomas to provide suggestion)*

3.14
product category
type of measure

3.15
(green deal) provider (GDP)
entity financing, facilitating and /or contracting the installation of measures on behalf of the customer under the financing mechanism initiated by the Energy Act 2011

NOTE Throughout this document the acronym GDP is used to identify an entity fulfilling the function defined in 3.15

3.16 (EEM) specifier
entity providing design/ specification services directly to customers in relation to the installation of energy efficiency measures undertaken outside of the financing mechanism initiated by the Energy Act 2011
NOTE This is a role similar but not necessarily identical, to that fulfilled by the Green Deal Provider (GDP) that can be undertaken by a suitably qualified installer or other entity for application of this PAS to projects undertaken outside of the green deal. Where this PAS is being applied to such a project, the term EEM specifier should be substituted for GDP wherever it appears in the document..

3.17
surveyor
person who has satisfactorily completed an installer designated training programme so as to be capable of assessing the suitability of buildings for installation of specified energy efficiency measure(s)

4 Installation Process

4.1 Process definition

Unless otherwise made available by the GDP, the installer shall define and record, the **installation process** for each energy efficiency measure to be installed under the scope of this PAS, before commencement of its installation. The installation process shall include:

The design of the energy efficiency measure (s) to be installed, including the products specified for that installation and the relevant measure installation annex (es) from this PAS**(4.2)**;

all information to be obtained from the GDP **(4.3)**

the method for installing the product including all constituent tasks **(4.4)**;

the tooling and equipment required for the installation, including any requirement for calibration **(4.5)**;

product related checking, handling and storage instructions **(4.6)**;

provision of installation instructions **(4.7)**;

requirement for intermediate inspection **(4.8);**

the training, and competence required of operatives by the installer to install the measure(s) in compliance with this PAS and its constituent annexes (**4.9)**;

engagement of sub-contractors **(4.10)**;

detail of any 'commissioning' action required on the part of the installer**(4.11)**

the information to be delivered to the customer at the time responsibility for the installed measure is handed over **(4.12)**;

installation control **(4.13)**;

This definition shall include reference to any other measures already installed or to be installed at the same location that may have an impact on the installation or operation of the product(s) and the arrangements to be made for their co-operation.

4.2 Energy efficiency measure design specification

4.2.1 Obtaining the design specification

The installer shall not commence installation at a location without first having obtained a location specific design specification for each measure to be installed at that location. For green deal related installations the design specification shall be obtained from the GDP authorizing that installation. For other installations, the design specification shall be obtained from the relevant EEM specifier.

4.2.2

The installer shall identify in the installation process definition, the measure specific annex (es) of this PAS relevant to the design specification for each installation to be undertaken and make provision in the process definition to fully implement the requirements that they set out.

4.3 Installation Information

When not already provided, the installer shall request the following information from the GDP in order to support the effective installation of the measure(s) to the required standard:

System design specification (including commissioning and expected performance);

Constituent product specification (including performance);

Details of and provision for, interrelationship between measures and measure installation: (a) mutual efficiency and effectiveness of measures, and (b) working procedures and timing;

Confirmation of installation instructions to be applied including those for any required interrelationship between measures;

Key customer requirements and expectations to be delivered including timing and access;

Confirmation that all necessary permissions have been obtained and any constraints made known*;

GDP provision for submission of and commitment to respond to, notifications by installer of problems with specification and installation;

Availability of any information that is to be provided by the installer, to the customer;

Confirmation that the necessary guarantees and warranties are in place;

Detail of the terms and conditions included in guarantees and warranties including any specific installation requirements or limitations that may affect their validity;

The installer shall not commence the installation until all the required information has been provided or written confirmation that none is necessary has been issued by the GDP e.g. in respect of specific customer requirements.

*NOTE * This should include information in respect of historic or listed properties covered by the Town & Country Planning Act 1990 or the Listed Buildings and Conservation Areas Act 1990.*

4.4 Installation methods

The method(s) for the installation of the energy efficiency measure(s) shall originate from the product specification sheets or other such guidelines and information provided by the product manufacturer supplier or GDP, with preference being given to material provided by the manufacturer or provided by the relevant Annex in this PAS.

Where an installation method is not provided with the product, the installer shall, prior to commencing the installation, contact the manufacturer, supplier of the product or GDP as applicable to obtain the required information,

In the event that installation methods cannot be obtained, commencement shall be deferred until the required alternative or customised method has been agreed and issued to the installer by the GDP.

4.5 Installation equipment and tools

4.5.1 Availability

Equipment appropriate to the installation process to be undertaken shall be available.

NOTE Attention is drawn to the existence of health and safety legislation in relation to the provision and use of tools and equipment.

4.5.2 Suitability and capability

The selection and use of equipment and tools shall be defined and relevant to the installation process being undertaken, as provided for in the methods obtained under **4.4.**

4.5.3 Calibration

4.5.3.1 Equipment requiring calibration shall be calibrated in accordance with the manufacturers instruction or verified at intervals determined by the installer prior to use. The interval between such calibration shall not exceed that recommended by the equipment manufacturer. Where equipment requiring calibration is hired, copies of calibration certificates shall be obtained and retained as a record.

4.5.3.2 Calibration and verification records for equipment, gauges, measuring and test equipment, shall include:

equipment identification, including the measurement reference standard against which the equipment is calibrated;

any out-of-specification readings when equipment is submitted for calibration;

a statement of conformity to specification after each calibration or verification.

4.5.3.3 In the event that the installer has reason to believe that a calibrated item may be out of calibration (e.g. the item has been dropped or mistreated) the installer shall have in place instruction that operatives cease using the item immediately and arrangement for its recalibration or replacement at the earliest practicable time. The installer shall record the date and time of all instances where recalibration or replacement is required during an installation, and take action to confirm any measurements that may have been made whilst the item was out of calibration.

4.5.4 Equipment and tool maintenance

4.5.4.1 Equipment required to carry out the installation processes shall be identified and resources provided for equipment and tool maintenance.

4.5.4.2 A planned preventive maintenance system shall be developed and implemented to include:

scheduled maintenance activities;

reviewing the effectiveness of planned maintenance when setting new schedules packaging and preservation of equipment, tooling and gauging;

technology and source data updates.

4.6 Checking, handling and storage

The installer shall operate a procedure to ensure that they are aware of any particular handling instructions and storage conditions for the measure(s)/ products that they are

installing under the scope of this PAS and that such requirements are effectively implemented.

4.7 Provision of installation instructions

The installer shall make available to the operative(s) for every installation undertaken the necessary product specifications, work instructions, installation methods and location specific information to enable the installation to be completed to the specification and time frame specified by the GDP.

Location specific information shall include at least the following:

customer expressed installation times and any commitments made

known special needs/ expectations in respect of the customer

notification of interrelationship between measures and measure installation at the same location, particularly in respect of the mutual efficiency and effectiveness of measures, working procedures and timing.

*NOTE It is expected that much of the above information will have been made available by the GDP **(4.3)***

4.8 Intermediate inspections

The installer shall include in the installation process definition the necessary facility to accommodate any intermediate inspections required by statutory authorities or instructed by the GDP.

4.9 People

4.9.1 Selection, training and work assignment

The installer shall establish and operate procedures to:

a) determine the skills and competence levels required by operatives to undertake the required installation tasks.

b) recruit and retain a sufficient number of operatives possessing the required skills at the required level of competence, or capable of acquiring those attributes with appropriate training;

c) provide or arrange access to any training required;

d) assign operatives to installation projects commensurate with the levels of skill and competence required and maintaining a record of the operatives assigned to and working on each project;

e) ensure that operatives undertaking installation tasks are informed of and understand the importance of their installation activities and how they contribute to the achievement of the efficiencies specified;

f) assess the effectiveness of procedures operated under a), b), c) d and e);

g) maintain records of current capability, training and competence for each operative.

NOTE Attention is drawn to the requirements relating to the employment and registration of competent operatives in the Green Deal Code of Practice and to the fact that these will need to be taken into account in any certification assessment that may be undertaken in respect of the application of PAS 2030.

4.9.2 Installation supervision

The installer shall assess the respective skills and competence of individuals assigned to the installation tasks required for each installation and provide a level of supervision in accordance with the competence ratio provided in the relevant measure specific annex of this PAS and sufficient to ensure that measures are installed at the designated location in accordance with the process definition **(4.1)** and to meet the design specification of the GDP.

4.10 Engagement of subcontract installers

The installer shall ensure that arrangements to sub-contract any part of an installation to another installer include requirements that the sub-contractor comply with all requirements of this PAS that are relevant to the installation tasks to be undertaken.

4.11 Commissioning

Where otherwise not covered by a product category specific requirement, it shall be the responsibility of the installer to ensure the installed measure(s) is commissioned, in accordance with the manufacturers' guidance and the GDPs design specification and in conformance with any relevant statutory regulations. Record shall be made of commissioning action undertaken including any performance measurement results, and copy made available to the GDP.

4.12 Handover

When the measure is fully installed and commissioned, and with any operationally material defects corrected, the installer shall undertake a handover procedure with the customer, as follows:

Where the installation is being funded under the United Kingdom Green Deal Financing Mechanism, the installer shall obtain instructions for the handover process from the GDP and undertake the handover accordingly.

Where the installation is outside the remit of the United Kingdom Green Deal Financing Mechanism, the installer shall prepare and work to a handover procedure including but not limited the provision of information on:

the safe operation of the installed measure, which could include operable components (eg: windows), electrical equipment, mechanical equipment and associated control devices (eg: boilers and heating controls);

the care of the installed measure to avoid detrimental effects (eg: avoidance of penetrating air barriers by inserting fixings into internally insulated walls, regular cleaning and replacement of air filters in mechanical ventilation systems);

the regular maintenance of the installation to ensure that it operates safely, efficiently and effectively. Such maintenance to be in accordance with the requirements of any guarantees or warranties provided by the manufacturer and/or the GDP;

the operation of the installation to facilitate the delivery of any expected reduction in energy use.

Prior to conducting the handover process the installer shall ensure they have access to adequate knowledge on the measures involved in the installation and the behaviours required for their safe, efficient and effective operation and maintenance. Information provided in the handover process shall be clear and structured, it shall be relevant, appropriate and devoid of technical jargon.

Where the handover is to be undertaken by the GDP, the installer shall supply such information and guidance as may be requested in advance of the handover and shall make arrangements to provide handover support as required. In advance of the handover the installer shall agree with the GDP the information and guidance to be left with the customer.

The handover process shall involve a physical viewing of the installed measure and an explanation of its function and operation, including where appropriate demonstrations of the operation of components, devices and controls using any user guides, maintenance manuals and other documents necessary for the safe, efficient and effective care, operation and maintenance of the installed measures. All guides, manuals and other relevant documentation shall be left with the customer(s) and/or located adjacent to the installed

measures where appropriate and convenient to do so. The Installer shall retain copies of these documents and supply copies to the GDP if requested to do so.

4.13 Installation control

The installer shall have in place and operate a documented installation control procedure appropriate for validating that the installations undertaken conform to the GDP's specification and/ or the relevant installation methods. Record of the installation control outcomes for each installation undertaken shall be made and signed off by a person authorized to do so on behalf of the installer.

4.14 Installation documents and record keeping

The installer shall have in place and operate a documented procedure to demonstrate that the information contained in the installation process definition **(4.1)** for each installation is available to and has been used by, the operatives undertaking that installation.

Records relating to the use of work instructions, relevant installation methods and constituent tasks shall include the nature and timing of any changes to installation related activities that may be authorized **(5.4).**

5 Installation process management

5.1 Operation and process oversight

The installer shall have in place and operate, procedures designed to ensure that installation processes are undertaken and completed so as to meet the design specification issued by the GDP to the satisfaction of the customer and in accordance with the requirements of this PAS.

5.2 Pre-installation survey

5.2.1 Undertaking the survey

The installer shall undertake a pre-installation survey at the designated location on the basis of the installation process definition prepared under 4.1, using a surveyor **(3.16)** authorised to do so. Record of the survey and its findings shall be made and retained with copy being made available to the GDP, when required.

5.2.2 Safety monitors

Where carbon monoxide (CO) or other monitors have already been installed at the designated location, the surveyor shall ascertain whether or not they are working correctly and report the outcome in the survey record. The surveyor shall also assess whether such existing monitors will provide adequate protection following the installation of new measures and recommend replacement or repositioning accordingly.

5.2.3 Presence of protected species

In the event that protected species (e.g. bats, birds, butterflies, dormice) or plants with special protection are found to be present at the designated location the surveyor shall include report of that presence in the survey record and make the presence known to the GDP and installer.

5.2.4 The pre-installation survey and post-installation condition

In undertaking the pre-installation survey the Installer shall confirm that there is no pre-existing breach of statutory regulation in respect of the location that could adversely affect the installer's responsibility not to leave the building in breach of such regulation. In the event that the location is not found to be compliant with statutory regulation the installer shall notify the GDP. Installation shall not commence until action in respect of the pre-existing breach has been determined.

5.2.5 Action in response to survey findings

In the event that the actual circumstances of the location are not as envisaged in the GDP generated information or upon examination reveal potential installation problems, the installer shall notify the GDP and any relevant statutory authorities and work with the GDP as necessary to develop a mutually agreed solution. Installation shall not commence until such solution has been agreed. The installer shall always obtain the written agreement of the GDP to any introduction of changes to the defined installation process.

5.3 Action in respect of Intermediate inspection

Where an intermediate inspection **(4.8)** is required by particular measures as part of the overall installation process, the installer shall establish and operate procedures to ensure that work that might impede subsequent inspection cannot continue until the intermediate inspection has been completed and clearance to continue issued.

5.4 Installation process change

5.4.1 Introduction of new or modified installation methods

Any variation to installation methods **(4.4)** shall be defined documented and agreed with the GDP before proceeding.

5.4.2 Compatibility of installation process change

Any change to an installation process shall be accompanied by a review of related tasks and methods to ensure compatibility with the installation of other measures being installed at the same premises

5.4.3 Internal feedback

All internally generated feedback from operatives on the installation process, positive or negative, shall be documented and acknowledged prior to being investigated and corrected where judged beneficial. Any decision not to take corrective action shall be documented including the reasons for reaching the decision.

5.5 Process continuity plan

Procedures shall be in place and operated to ensure that, in the event of an unforeseen circumstance, all installation processes currently in progress or otherwise outstanding can be completed in accordance the relevant GDPs design specification and in accordance with this PAS, whilst remaining under the original installer's direction and responsibility.

5.6 Process control

The installer shall have in place a documented installation process control procedure capable of demonstrating that the requirements of this PAS have been met for each installation undertaken including the completion of the installation control procedure **(4.14).** Record of the application of the installation process control procedure shall be maintained for each installation and signed off by a competent person authorized to do so on behalf of the installer.

NOTE 1 The appointment of competent persons authorized to sign off installation quality control records is the prerogative of the installer who is entitled to decide the level of competence required.

*NOTE 2 In addition to the sign-off procedures required under **5.6 and 5.8** the GDP may be required or may choose, to undertake a separate validation and sign-off process.*

5.7 Internal audit and corrective action

5.7.1 Procedure

A procedure for internal auditing of installation processes by the installer shall be established, implemented and documented to ensure that over the course of a **12** month period each type of installation process undertaken is audited at least once to check

conformity to the requirements of this PAS. Record of such audit and any resulting actions shall be made and retained.

NOTE It is recommended that installers carrying out large numbers of installations of the same type consider undertaking audits more frequently on a percentage basis, in preference to the maximum interval specified above.

5.7.2 Investigation

The cause and consequences of issues raised during internal audit **(5.7.1)** shall be identified, systematically examined and the findings documented.

5.7.3 Corrective action

Corrective action shall include rectification of the particular occurrence identified under **5.6.2** and initiation of measures to prevent recurrence.

5.7.4 Verification of corrective action

The effectiveness of corrective actions undertaken **(5.6.3)** shall be **assessed by the installer** and outcomes documented.

5.8 Installation process records

The installer shall establish and maintain records containing at least the information identified in a) through h) of this clause, in relation to each installation undertaken. Installation process records shall be retained for not less than six years or the designated payback period for the measure, whichever is the longer and shall be made available to the relevant GDP when requested.

location of the installation;

type of measure(s) installed;

dates of installation commencement; completion and commissioning;

identification of specific products installed;

details of any problems encountered, corrections agreed and remedial work undertaken;

name(s) of operatives undertaking the installation and their competence rating;

results of performance testing carried out;

confirmation that the installation process has been undertaken in accordance with this PAS shall be prepared for each installation and signed off by a competent person authorized to do so on behalf of the installer.

*NOTE In addition to the sign-off procedures required under **5.6 and 5.8** the GDP may be required or may choose, to undertake a separate validation and sign-off process.*

5.9 Liability cover

The installer shall have arrangements sufficient to cover liability for the entirety of the installation work undertaken under the scope of this PAS.

6 Service provision

6.1 Complaints procedure

The installer shall have in place and operate, a documented complaints procedure appropriate for:

a) receiving, recording, acknowledging and transferring to the relevant GDP all complaints from customers. This procedure shall include taking steps to confirm that the complaint has been addressed by the GDP and the issue resolved.

b) receiving, recording and addressing complaint from a GDP. The record shall include actions taken to resolve issues that have been the subject of complaint and of the outcome including evidence that the GDP making the complaint is satisfied with the outcome.

6.2 Interaction with customers

The installer shall have in place and operate a procedure to instruct each operative likely to have direct contact with customers, as to how to act in response to an approach from customers especially but not exclusively in respect of:

a) pre-notified customer requirements and expectations particularly issues of work timing and access

b) GDP stipulated customer service requirements

c) customer questions or requests for information

d) customer request for additional measure related work extending beyond the installation process definition

e) customer complaint or other customer feedback in respect some aspect of the installation or installation process

f) meeting the installers general responsibility for observing the customer service principles and requirements set out in the Green Deal Code of Practice for GDPs

7 Claims of conformity

7.1 General requirement

Installation processes for which conformity with this specification is claimed shall be evidenced by the inclusion of the following information in associated documentation including any documentation issued to the customer:

a) the number and date of this Publicly Available Specification

b) identification of the installed measure(s) and the relevant measure specific annex(es) of PAS 2030

c) the postal address of the building in which the measure was installed.

d) The date of handover of the installed measure(s)

e) the name or trade mark of the installer;

7.2 Declarations of conformity

Declaration of conformity to this PAS shall be expressed in the form:

The installation of [*energy efficiency measure*] at [*location of installation*] and handed over on[*date of handover*] has been undertaken by [*name of installer*] using an installation process complying with PAS 2030:2011 including annex(es) [*insert references to relevant measure specific annex(es)*].

NOTE The inclusion of reference to PAS 2030:2011 in relation to a particular installed measure represents the installer's declaration that the installation process used meets the requirements of this standard. The accuracy of the claim is solely the claimant's responsibility and is not to be confused with third party certification of conformity.

Annex A (normative)
Condensing Boilers, Natural Gas-fired and Liquefied Petroleum Gas-fired (Domestic and Non-domestic)

A.1 Additional installation requirements

When installing a gas-fired condensing boiler, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section A.1 of Table A.1 taking account of the health and safety considerations identified at A.7 and Annex AA.

A.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of a gas-fired condensing boiler, the installer shall employ or contract only a surveyor meeting the competence requirements of A.2 of Table A1.

A.3 Operative competence

When installing a gas-fired condensing boiler, the installer shall employ or contract only operatives meeting the competency requirements set out in A.3 and A.4 of Table A1 at the competency ratio specified in A.5.

A.4 Provision of information in respect of gas-fired condensing boilers

At the time of handover of a gas-fired condensing boiler to the customer, the installer shall ensure that the information identified at A.6 of Table A1 is provided to the customer as part of the handover process required in **4.12.**

Table A.1 – Measure specific requirements for gas-fired condensing boilers

Measure		Condensing Boilers, Natural Gas-fired and Liquefied Petroleum Gas-fired (Domestic and Non-domestic)
Product Category		Natural Gas-fired and Liquefied Petroleum Gas-fired Condensing Boilers
A.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions. Where relevant to the type of installation being undertaken, the requirements or guidance given in: I. BS 6798: 2009, Specification for installation and maintenance of gas-fired boilers of rated input not exceeding 70 kW net. II. BS 6644 2005+A1: 2008, Specification for installation of gas-fired boilers of rated inputs between70 kW (net) and 1.8 MW (net) (2nd and 3rd family gases) III. BS 6891:2005+A2:2008, Installation of low pressure gas pipework of up to 35 mm (R1 1/4) in domestic premises (2nd

		family gas). Specification IV. BS 5440-1: 2008, Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) – Part 1: Specification for installation of gas appliances to chimneys and for maintenance of chimneys. V. BS 5440-2: 2009, Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) – Part 2: Specification for the installation and maintenance of ventilation provision for gas appliances. VI. BS 7593:2006, Code of practice for treatment of water in domestic hot water central heating systems VII. IGEM/UP/2, Edition 2, Installation of pipework on industrial and commercial premises VIII. UKLPG, Code of Practice 22, LPG Piping System Design and Installation *NOTES to A1: Attention is drawn to the need, where relevant, for all gas-fired condensing boiler installation work to comply with:* *i. the current The Gas Safety (Installation and Use) Regulations that apply in the UK country or locality in which the installation is being carried out. The Gas Safety (Installation and Use) Regulations have requirements relating to both technical gas safety standards and qualification and supervision of persons carrying out gas work* *ii. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, hot water safety, heat producing appliances, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.* *iii. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out.* iv. *the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*
A.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section A.3 of Table A.	As defined under Section A.3 of Table A.
	Operative threshold	Competence required	Route(s) to competence

A.3	competence requirements	Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 2C - Minimum Competency for Common Processes (Compressed Gas Welded Pipework Installation) 2D - Minimum Competency for Common Processes (Manual Arc Welded Pipework Installation) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation(Domestic) 10B – Wet' central heating systems installation (underfloor) 10C - 'Wet' central heating systems installation (Non-domestic) 13A - Energy Efficiency for domestic heating and hot water 13B - Energy Efficiency for non-domestic heating and hot water Common minimum Technical Competences Annexes 2A,2B, 2C, 2D, 6A, 9A, 9B, 9C, 10A, 10B, 10C, 13A and 13B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems • SUMMES30 Prepare resources for pipe jointing activities In additional, all gas-fired condensing boiler electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8). *NOTE to A.3: As stated under Section A.1 of Table A, the Gas Safety (Installation and Use) Regulations have requirements relating to qualification and supervision of persons carrying out gas work. These requirements are not repeated here; however, installers are reminded of the legal obligation to meet the requirements.*	
	Operative specialist competence requirements	Competence required	Route(s) to competence
		Competence as specified for threshold operatives with no additional requirements	Not applicable
A.4	Current Competency	Currency of competency in accordance with A.2 and A.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in A.2 and A.3, including any revisions to the	

		cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. NOTE 1: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions. NOTE 2: The currency of competency requirements stated above relate only to the competence requirements stated within this annex and do not relate to or replace the qualification and supervision requirements stated within Gas Safety (Installation and Use) Regulations.
A.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section U.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work. NOTE 2: The on-the-job training and development competence ratio requirements stated above apply only where such activity would not be in contravention of the Gas Safety (Installation and Use) Regulations and/or any other relevant regulations. Installers are responsible for identifying and ensuring compliance with the relevant regulatory requirements.
A.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written Information** • Product manufacturer installation and servicing instructions • Product manufacturer user manuals/guides • Product warranty information and guarantees • Benchmark commissioning certificate of other commissioning certificate that meets the requirements of the Building Regulations • System cleaning and water treatment record (if not included in the commissioning certificate) • Installer details (if not included in the commissioning certificate) e.g. mechanical, electrical • Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days) • A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations) **Verbal information and/or demonstration**

		• An explanation of the purpose and relevance the written information provided • An explanation of system safety features and controls and any information relating to what the end user should do in the event of the safety features and controls being activated • An explanation of what controls/components should not be adjusted by the system user • An explanation of maintenance requirements and frequency and any maintenance services available. • Demonstration of: o how to set user controls for maximum efficiency o any safety checks that the system user should undertake o what to do in the case of an emergency or perceived emergency
A.7	Health and safety considerations	Attention is drawn to the need for all gas-fired condensing boiler work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to A7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex B (normative)
Condensing Boilers, Oil-fired (Domestic and Non-domestic)

B.1 Additional installation requirements

When installing oil-fired condensing boilers, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section B.1 of Table B.1 taking account of the health and safety considerations identified at B7 and Annex AA.

B.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of oil-fired condensing boilers, the installer shall employ or contract only a surveyor meeting the competence requirements of B.2 of Table B1.

B.3 Operative competence

When installing oil-fired condensing boilers, the installer shall employ or contract only operatives meeting the competency requirements set out in B.3 and B.4 of Table B.1 at the competency ratio specified in B.5.

B.4 Provision of information in respect of oil-fired condensing boilers

At the time of handover of the oil-fired condensing boiler to the customer, the installer shall ensure that the information identified at B.6 of Table B1 is provided to the customer as part of the handover process required in **4.12.** .

Table B.1 – Measure specific requirements for oil-fired condensing boilers

Measure		Condensing Boilers, Oil-fired (Domestic and Non-domestic)
Product Category		Oil-fired Condensing Boilers
B.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions. Where relevant to the type of installation being undertaken, the requirements or guidance given in: I. BS 5410-1: 1997 Code of practice for oil firing. Installations up to 45 kW output capacity for space heating and hot water supply purposes II. BS 5410-2: 1978 Code of practice for oil firing. Installations of 45 kW and above output capacity for space heating, hot water and steam supply service III. BS 7593:2006 Code of practice for treatment of water in domestic hot water central heating systems

		NOTES to B1: Attention is drawn to the need, where relevant, for all oil-firing condensing boiler installation work to comply with: *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, hot water safety, heat producing appliances, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.* *ii. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out.* iii. *the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
B.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section B.3 of Table B.1	As defined under Section B.3 of Table B.1
B.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 2C - Minimum Competency for Common Processes (Compressed Gas Welded Pipework Installation) 2D - Minimum Competency for Common Processes (Manual Arc Welded Pipework Installation) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation(Domestic) 10B – Wet' central heating systems installation (under-floor)	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		10C - 'Wet' central heating systems installation (Non-domestic) 13A - Energy Efficiency for domestic heating and hot water 13B - Energy Efficiency for non-domestic heating and hot water Common minimum Technical Competences Annexes 2A,2B, 2C, 2D, 6A, 9A, 9B, 9C, 10A, 10B, 10C, 13A and 13B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems • SUMMES30 Prepare resources for pipe jointing activities In additional, all oil-firing condensing boiler electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8).	
	Operative specialist	Competencies required	Route(s) to competence

	competence requirements	In addition to the above threshold competence, specialist operative competence based on the following is required: Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: Annex 4A – Minimum Competence for Oil-fired combustion appliance installation (domestic) 4B - Oil-fired combustion appliance installation (non-domestic) 4C - Oil storage tank and associated pipework installation Common minimum Technical Competences Annexes 4A, 4B and 4C have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES8 Identify systems, equipment and components • SUMMES9 Install domestic heating systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems	As defined with each Common Minimum Technical Competence Annex referred to in the adjacent column
B.4	Current Competency	Currency of competency in accordance with B.2 and B.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in B.2 and B.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE 1: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.* *NOTE 2: The Common Minimum Technical Competency Annexes 4A, 4B and 4C require renewal of qualifications/certifications at 5 yearly intervals.*	
B.5	Competence Ratio	Where on-the-job training and development is undertaken in relation to the threshold competence requirements stated under B.3, the maximum competent person/trainee ratio is 1:2	

		Where on-the-job training and development is undertaken in relation to the specialist competence requirements stated under B.3, the maximum competent person/trainee ratio is 1:1 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section B.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.

B.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written Information**
		• Product manufacturer installation and servicing instructions
		• Product manufacturer user manuals/guides
		• Product warranty information and guarantees
		• Commissioning certificate that meets the requirements of the Building Regulations
		• System cleaning and water treatment record (if not included in the commissioning certificate)
		• Installer details (if not included in the commissioning certificate)
		  o mechanical
		  o electrical
		• Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days)
		• A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations)
		
		Verbal information and/or demonstration
		
		• An explanation of the purpose and relevance the written information provided
		• An explanation of system safety features and controls and any information relating to what the end user should do in the event of the safety features and controls being activate
		• An explanation of what controls/components should not be adjusted by the system user
		• An explanation of maintenance requirements and frequency and any maintenance services available.
		• Demonstration of:
		  o how to set user controls for maximum efficiency
		  o any safety checks that the system user should undertake
		  o what to do in the case of an emergency or perceived emergency

B.7	Health and safety considerations	Attention is drawn to the need for all oil-firing condensing boilers installation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc Act 1974. *NOTE to B7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a*

		set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.

Annex C (normative)
Heating Controls

C.1 Additional installation requirements

When installing heating controls, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section C.1 of Table C.1 taking account of the health and safety considerations identified at C.7 and Annex AA.

C.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of heating controls, the installer shall employ or contract only a surveyor meeting the competence requirements of C.2 of Table C.1.

C.3 Operative competence

When installing heating controls, the installer shall employ or contract only operatives meeting the competency requirements set out in C.3 and C.4 of Table C.1 at the competency ratio specified in C.5.

C.4 Provision of information in respect of heating controls

At the time of handover of heating controls to the customer, the installer shall ensure that the information identified at C.6 of Table C.1 is provided to the customer as part of the handover process required in **4.12.** .

Table C.1 – Measure specific requirements for heating controls

Measure		Heating Controls
Product Category		Thermostatic Radiator Valves (TRVs), Programmers, Room Thermostats, Cylinder Thermostats
C.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions. *NOTES to C.1: Attention is drawn to the need, where relevant, for all heating controls installation work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, hot water safety, heat producing appliances, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook.*

		Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V. ii. *the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
C.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section C.3 of Table C.1	As defined under Section C.3 of Table C.1
C.3	Operative, threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 2C - Minimum Competency for Common Processes (Compressed Gas Welded Pipework Installation) 2D - Minimum Competency for Common Processes (Manual Arc Welded Pipework Installation) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation(Domestic) 10B – Wet' central heating systems installation (underfloor) 10C - 'Wet' central heating systems installation (Non-domestic) 13A - Energy Efficiency for domestic heating and hot water 13B - Energy Efficiency for non-domestic heating and hot water Common minimum Technical Competences Annexes 2A,2B, 2C, 2D, 6A, 9A, 9B, 9C, 10A, 10B, 10C, 13A and 13B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		practices • SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems • SUMMES30 Prepare resources for pipe jointing activities In additional, all heating controls installation electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8).	
	Operative, specialist competence requirements	Competence required	Route(s) to competence
		Competence as specified for threshold operatives with no additional requirements	Not applicable
C.4	Current Competency	Currency of competency in accordance with C.2 and C.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in C.2 and C.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to C4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
C.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2	

		Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section C.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work. *NOTE to C5: The on-the-job training and development competence ratio requirements stated above apply only where such activity would not be in contravention of the Gas Safety (Installation and Use) Regulations and/or any other relevant regulations. Installers are responsible for identifying and ensuring compliance with the relevant regulatory requirements.*

C.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written Information**
		• Product manufacturer installation and servicing instructions
		• Product manufacturer user manuals/guides
		• Product warranty information and guarantees
		• Installer details
		  o mechanical
		  o electrical
		• Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days)
		• A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations)
		Verbal information and/or demonstration
		• An explanation of the purpose and relevance the written information provided
		• An explanation of system safety features and controls and any information relating to what the end user should do in the event of the safety features and controls being activated
		• An explanation of what controls/components should not be adjusted by the system user
		• An explanation of maintenance requirements and frequency and any maintenance services available.
		• Demonstration of:
		  o how to set user controls for maximum efficiency
		  o any safety checks that the system user should undertake

C.7	Health and safety considerations	Attention is drawn to the need for all heating control work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to C7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex D (normative)
Under-floor Heating

D.1 Additional installation requirements

When installing under-floor heating, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section D.1 of Table D.1 taking account of the health and safety considerations identified at D.7 and Annex AA.

D.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of under-floor heating, the installer shall employ or contract only a surveyor meeting the competence requirements of D.2 of Table D.1.

D.3 Operative competence

When installing under-floor heating, the installer shall employ or contract only operatives meeting the competency requirements set out in D.3 and D.4 of Table D.1 at the competency ratio specified in C.5.

D.4 Provision of information in respect of under-floor heating

At the time of handover of under-floor heating, the installer shall ensure that the information identified at D.6 of Table D.1 is provided to the customer as part of the handover process required in **4.12.** .

Table D.1 – Measure specific requirements for under-floor heating

Measure		Under-floor Heating
Product Category		Under-floor Heating (wet systems)
D.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions The requirements stated in BS EN 1264-4 2009 Water based surface embedded heating and cooling systems Part 4: Installation *NOTES to D.1 Attention is drawn to the need, where relevant, for all under-floor heating system work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power and electrical safety. Further guidance on the*

		requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V. *ii. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: prevention of contamination of the wholesome water supply, energy conservation, safe operation, testing and commissioning* *iii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
D.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section D.3 of Table D.1	As defined under Section D.3 of Table D.1
D.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) Common Minimum Technical Competence Annex 2A and 2B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards: • SUMMES1 Apply health and safety legislation and working practices	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column; and Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		• SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components In addition, all under-floor heating installation electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMET 1-SUMET8).	
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: The competence requirements defined in Common Minimum Technical Competence Annex 10B - Minimum Competency for 'Wet' Central Heating Systems Installation Work (Under-floor Heating). Common Minimum Technical Competence Annex 10B derived from, and is cross-referenced to, the following SummitSkills National Occupational Standards: • SUMMES7 (M7) Prepare to carry out work • SUMMES8 (M8) Identify systems, equipment and components • SUMMES9 (M9) Install domestic heating systems, equipment	As defined within Common Minimum Technical Competence Annex 10B

		and components • SUMMES25 (M25) Inspect and test mechanical systems, equipment and components • SUMMES27 (M27) Commission mechanical systems	
D.4	Current Competency	Currency of competency in accordance with D.2 and D.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in D.2 and D.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.	
D.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section D.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	

D.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written Information**
		• Product Manufacturer user manuals/guides and guarantee documents
		• Testing and commissioning certificates
		• Water treatment records
		• Installer details
		  o mechanical
		  o electrical
		Diagrammatic Information
		• Hydraulic schematic
		• Wiring schematic
		Verbal information/ demonstration	

		• Setting of controls • Awareness of the effect that changing to a different type of floor covering may have on system output • Awareness of which system components should only be adjusted by a competent engineer
D.7	Health and safety considerations	Attention is drawn to the need for all under-floor heating system installation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to D.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex E (normative)
Flue-gas Recovery Devices

E.1 Additional installation requirements

When installing flue-gas recovery devices, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section E.1 of Table E.1 taking account of the health and safety considerations identified at E.7 and Annex AA.

E.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of flue-gas recovery devices, the installer shall employ or contract only a surveyor meeting the competence requirements of E.2 of Table E.1.

E.3 Operative competence

When installing flue-gas recovery devices, the installer shall employ or contract only operatives meeting the competency requirements set out in E.3 and E.4 of Table E.1 at the competency ratio specified in E.5.

E.4 Provision of information in respect of flue-gas recovery devices

At the time of handover of the flue-gas recovery device to the customer, the installer shall ensure that the information identified at E.6 of Table E.1 is provided to the customer as part of the handover process required in **4.12.** .

Table E.1 – Measure specific requirements for flue-gas recovery devices

Measure		Flue-gas Recovery Devices
Product Category		Flue-gas Heat Recovery Devices for use with gas-fired condensing boilers (domestic scale)
E.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions. *NOTES to E.1: Attention is drawn to the need, where relevant, for all flue-gas recovery device installation work to comply with:* *i. the current Gas Safety (Installation and Use) Regulations that apply in the UK country or locality in which the installation is being carried out. The Gas Safety (Installation and Use) Regulations have requirements relating to both technical gas safety standards and qualification and supervision of persons carrying out gas work and work on gas appliances.* *ii. the current Building Regulations that apply in the UK country in which the installation is being carried out. Further*

		guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V. iii. *the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out.* iv. *the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
E.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section E.3 of Table E.1.	As defined under Section E.3 of Table E.1.
E.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) Common minimum Technical Competences Annexes 2A, 6A, 9A and 9B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column.

<table>
<tr><td></td><td></td><td>• SUMMES27 Commission mechanical systems

NOTE to E.3: As stated under Section E.1 of Table E.1, the Gas Safety (Installation and Use) Regulations have requirements relating to qualification and supervision of persons carrying out gas work and work on gas appliances. These requirements are not repeated here; however, installers are reminded of the legal obligation to meet the requirements.</td><td></td></tr>
<tr><td rowspan="2"></td><td rowspan="2">Operative specialist competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>Competence as specified for threshold operatives with no additional requirements.</td><td>Not applicable</td></tr>
<tr><td>E.4</td><td>Current Competency</td><td colspan="2">Currency of competency in accordance with E.2 and E.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in E.2 and E.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced.

NOTE 1: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.

NOTE 2: The currency of competency requirements stated above relate only to the competence requirements stated within this annex and do not relate to or replace the qualification and supervision requirements stated within Gas Safety (Installation and Use) Regulations.</td></tr>
<tr><td>E.5</td><td>Competence Ratio</td><td colspan="2">Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2

Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section E.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.

NOTE: The on-the-job training and development competence ratio requirements stated above apply only where such activity would not be in contravention of the Gas Safety (Installation and Use) Regulations and/or any other relevant regulations. Installers are responsible for identifying and ensuring compliance with the relevant regulatory requirements.</td></tr>
<tr><td>E.6</td><td>Measure specific Information to</td><td colspan="2">Written Information</td></tr>
</table>

	be handed-over to the customer in accordance with 4.12.	• Product manufacturer installation and servicing instructions • Product warranty information and guarantees • Benchmark commissioning certificate of other commissioning certificate that meets the requirements of the Building Regulations • Installer details **Verbal information and/or demonstration** • An explanation of the purpose and relevance the written information provided
E.7	Health and safety considerations	Attention is drawn to the need for all flue-gas recovery device work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to E.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex F (normative)
Gas-fired Warm-air Heating Systems (Domestic and Non-domestic)

F.1 Additional installation requirements

When installing gas-fired warm-air heating systems (domestic and non-domestic), in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section F.1 of Table F.1 taking account of the health and safety considerations identified at F.7 and Annex AA.

F.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of gas-fired warm-air heating systems (domestic and non-domestic), the installer shall employ or contract only a surveyor meeting the competence requirements of F.2 of Table F.1.

F.3 Operative competence

When installing gas-fired warm-air heating systems (domestic and non-domestic), the installer shall employ or contract only operatives meeting the competency requirements set out in F.3 and F.4 of Table F.1 at the competency ratio specified in F.5.

F.4 Provision of information in respect of gas-fired warm-air heating systems

At the time of handover of the gas-fired warm-air heating system (domestic and non-domestic), the installer shall ensure that the information identified at F.6 of Table F.1 is provided to the customer as part of the handover process required in **4.12.** .

Table F.1 – Measure specific requirements for gas-fired warm-air heating systems (domestic and non-domestic)

Measure		Gas-fired Warm-air Heating Systems (Domestic and Non-domestic)
Product Category		Gas-fired Warm-air Heating Systems
F.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions. Where relevant to the type of installation being undertaken, the requirements or guidance given in: I. BS 5864:2010 Installation and maintenance of gas-fired ducted air heaters of rated heat input not exceeding 70 kW net (2nd and 3rd family gases). Specification II. BS 6891:2005+A2:2008, Installation of low pressure gas pipework of up to 35 mm (R1 1/4) in domestic premises (2nd family gas). Specification III. BS 5440-1: 2008, Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family

		gases) – Part 1: Specification for installation of gas appliances to chimneys and for maintenance of chimneys. IV. BS 5440-2: 2009, Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) – Part 2: Specification for the installation and maintenance of ventilation provision for gas appliances. V. IGE/UP/1 Edition 2, Strength testing, tightness testing and direct purging of industrial and commercial gas installations VI. IGE/UP/1A Edition 2, Strength testing, tightness testing and direct purging of small low pressure industrial and commercial Natural Gas installations VII. IGEM/UP/2, Edition 2, Installation of pipework on industrial and commercial premises VIII. IGEM/UP/7, Edition 2, Gas installations in timber-framed and light steel buildings IX. UKLPG, Code of Practice 22, LPG Piping System Design and Installation *NOTES to F.1: Attention is drawn to the need, where relevant, for all gas-fired warm air heating system installation work to comply with:* *i. the current Gas Safety (Installation and Use) Regulations that apply in the UK country or locality in which the installation is being carried out. The Gas Safety (Installation and Use) Regulations have requirements relating to both technical gas safety standards and qualification and supervision of persons carrying out gas work and work on gas appliances.* *ii. the current Building Regulations that apply in the UK country in which the installation is being carried out. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.* *iii. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out.* iv. *the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
F.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section F.3 of Table F.1.	As defined under Section F.3 of Table F.1.
F.3	Operative threshold competence requirements	Competencies required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic)	1) Level 3 QCF *Understand and apply domestic warm air heating installation and maintenance techniques*. M/502/8931. Level 3 QCF *Install, commission, service and maintain*

		6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 10D – Warm Air Heating Systems Installation (Domestic) 10E – Warm Air Heating System Installation (Non-domestic) Common minimum Technical Competences Annexes 2A, 6A, 9A, 10D and 10E have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES7 Prepare to carry out work • SUMMES8 (M8) Identify systems, equipment and components • SUMMES9 Install domestic heating systems, equipment and components • SUMMES10 Install plumbing systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components In additional, all gas-fired warm air heating systems electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8). *NOTE to F.3: As stated under Section F.1 of Table F.1, the Gas Safety (Installation and Use) Regulations have requirements relating to qualification and supervision of persons carrying out gas work. These requirements are not repeated here; however, installers are reminded of the legal obligation to meet the requirements.*	*domestic warm air heating installation and maintenance techniques*. T/502/8932 2) Alternative certification that has been mapped to the competence requirements as defined within each Common Minimum Technical Competence Annex referred to in the adjacent column. 3) Experienced worker assessment conducted by an appropriate body against the competence requirements as defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

	Operative specialist competence requirements	Competence required	Route(s) to competence
		Competence as specified for threshold operatives with no additional requirements.	Not applicable
F.4	Current Competency	Currency of competency in accordance with F.2 and F.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in F.2 and F.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE 1 to F.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.* *NOTE 2 to F.4: The currency of competency requirements stated above relate only to the competence requirements stated within this annex and do not relate to or replace the qualification and supervision requirements stated within Gas Safety (Installation and Use) Regulations.*	
F.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section F.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work. *NOTE to F.4: The on-the-job training and development competence ratio requirements stated above apply only where such activity would not be in contravention of the Gas Safety (Installation and Use) Regulations and/or any other relevant regulations. Installers are responsible for identifying and ensuring compliance with the relevant regulatory requirements.*	

F.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written Information**
		• Product manufacturer installation and servicing instructions
		• Product manufacturer user manuals/guides
		• Product warranty information and guarantees
		• Commissioning certificate that meets the requirements of the Building Regulations
		• Installer details (if not included in the commissioning certificate)
		  ○ mechanical
		  ○ electrical
		• Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days)
		• A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building	

		Regulations and/or the current version of BS7671 (IET Wiring Regulations) **Verbal information and/or demonstration** • An explanation of the purpose and relevance the written information provided • An explanation of system safety features and controls and any information relating to what the end user should do in the event of the safety features and controls being activated • An explanation of what controls/components should not be adjusted by the system user • An explanation of maintenance requirements and frequency and any maintenance services available. • Demonstration of: o how to set user controls for maximum efficiency o any safety checks that the system user should undertake o what to do in the case of an emergency or perceived emergency
F.7	Health and safety considerations	Attention is drawn to the need for all gas-fired warm-air heating system work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to F.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex G (normative)
Electric Storage Heaters (Domestic and Non-domestic)

G.1 Additional installation requirements

When installing electric storage heaters (domestic and non-domestic), in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section G.1 of Table G.1 taking account of the health and safety considerations identified at G.7 and Annex AA.

G.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of electric storage heaters (domestic and non-domestic), the installer shall employ or contract only a surveyor meeting the competence requirements of G.2 of Table G.1.

G.3 Operative competence

When installing electric storage heaters (domestic and non-domestic), the installer shall employ or contract only operatives meeting the competency requirements set out in G.3 and G.4 of Table G.1 at the competency ratio specified in G.5.

G.4 Provision of information in respect of electric storage heaters (domestic and non-domestic)

At the time of handover of the electric storage heaters (domestic and non-domestic) to the customer, the installer shall ensure that the information identified at G.6 of Table G.1 is provided to the customer as part of the handover process required in **4.12.** .

Table G.1 – Measure specific requirements for electric storage heaters (domestic and non-domestic)

Measure		Electric Storage Heaters (domestic and non-domestic)
Product Category		Electric Storage Heaters
G.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The installer is responsible for: • Following the requirements or guidance given in product manufacturers instructions • Ensuring all electric storage heater work complies with the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671) • (Domestic) following the working instructions derived from Competent Person Schemes under 'Part P' of the Building Regulations for England and Wales, the Scottish Scheme for Certification of Construction and the Northern Irish equivalent.

		• (Non-domestic) following the working instructions derived from a UK recognised industry certification scheme in accordance with the Electrotechnical Assessment Specification (EAS).	
G.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section G.3 of Table G.1.	As defined under Section G.3 of Table G.1.
G.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Competencies are featured in Table 4A of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) – *Minimum Technical Competence Criteria Required for a Qualified Supervisor for Electrical Installations in Dwellings Only*; or Table 4B of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) – *Minimum Technical Competence Criteria required for a Qualified Supervisor for all Electrical Installation Work* as appropriate, and are derived from the following National Occupational Standards for the Electrotechnical Industry: • SUMETS1 • SUMETS2 • SUMETS3 • SUMETS4 • SUMETS5 • SUMETS6 • SUMETS7 • SUMETS8	1) Level 3 NVQ *Diploma in Installing Electrotechnical Systems and Equipment (Building Structures and the Environment)* 2357-13/91. 2) Experienced worker assessment conducted by an appropriate body against the competence requirements specified within: Table 4A of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) – *Minimum Technical Competence Criteria Required for a Qualified Supervisor for Electrical Installations in Dwellings Only*; or Table 4B of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) – *Minimum Technical Competence Criteria required for a Qualified Supervisor for all Electrical Installation Work* as appropriate.
	Operative specialist	Competence required	Route(s) to competence

	competence requirements	Competence as specified for threshold operatives with no additional requirements.	Not applicable
G.4	Current Competency	Currency of competency in accordance with G.2 and G.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in G.2 and G.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE 1: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
G.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section G.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
G.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written Information** • Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days) • A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations) • Product manufacturer installation and servicing instructions • Any manufacturer or product data or information sheets • Product warranty information and guarantees • Benchmark commissioning certificate of other commissioning certificate that meets the requirements of the Building Regulations • Installer details **Verbal information and/or demonstration** • An explanation of the purpose and relevance the written information provided • An explanation of system safety features and controls and any information relating to what the end user should do in the	

		event of the safety features and controls being activated
		• An explanation of what controls/components should not be adjusted by the system user
		• An explanation of maintenance requirements and frequency and any maintenance services available
		• Demonstration of:
		  ○ how to set user controls for maximum efficiency
		  ○ any safety checks that the system user should undertake
		• What to do in the case of an emergency or perceived emergency

G.7	Health and safety considerations	Attention is drawn to the need for all electric storage heater (domestic and non-domestic) installation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to G.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex H (normative)
Cavity Wall Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Cavity Wall Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Cavity Wall Insulation, taking account of the expert view submitted during this review.

Version 1

H.1 Additional installation requirements

When installing cavity wall insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section H.1 of Table H.1 taking account of the health and safety considerations identified at H.7 and Annex AA.

H.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of cavity wall insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of H.2 of Table H.1.

H.3 Operative competence

When installing cavity wall insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in H.3 and H.4 of Table H.1 at the competency ratio specified in H.5.

H.4 Provision of information in respect of cavity wall insulation

At the time of handover of the cavity wall insulation to the customer, the installer shall ensure that the information identified at H.6 of Table H.1 is provided to the customer as part of the handover process required in **4.12.** .

Table H.1 – Measure specific requirements for cavity wall insulation

Measure	Cavity Wall Insulation
Product Category	Cavity Wall Insulation

H.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	Cavity wall insulation installed shall be the subject of a current certificate awarded to a System Supplier against UK requirements and regulations. The Installer is responsible for: • Obtaining approval from the system supplier before an application for assessment/ certification is made to a certification body • Arranging for operatives to receive training from the system supplier to the competence level required to consistently install the cavity wall insulation in accordance with the related certificate • Ensuring that specialist operatives (carded) undergo an on-site inspection by the system supplier, x times each calendar year • Ensuring that the Surveyors and Operatives meet the requirements of the System Supplier and this PAS Document • Maintaining the Certificate and installation manual for which the installer is approved • Maintaining records of all Surveyors and Operatives including dates of individual approval • Maintaining robust documentation identifying all work in progress and completed installations • Responding to the certification body for requests of ongoing and completed works and acting on any actions raised during an inspection and completing the required remedial works within a specific timescale • Monitoring and inspecting the Operatives on site to ensure they continually comply with the requirements of the PAS Document. • Maintaining technical support to the Surveyors and Operatives • Maintaining equipment maintenance schedules • Provision of an initial surveyors report that includes as a minimum: o The names of the Green Deal Installer, the Surveyor and Operative (if different from Surveyor) o The name and address of the customer and the location of the building o A signed declaration that the building has been assessed according to the requirements of the Certificate and the PAS document o Identification of essential ventilation openings that require safeguarding before installation o The position of all flues whether or not they are in service and measures that must be taken to safeguard their proper functioning *NOTE to H.1 Surveillance of training and installation work is carried out by Green Deal Inspectors, trained and experienced in the*

		technology, which ensures that the installing operatives are competent to install the related product or system in accordance with the relevant certificate.	
H.2	Surveyor competence requirements	Competence required	Route(s) to competence
		• Knowledge of the building type and loft construction concerned and the specific cavity wall insulation system proposed. • Suitability of the site	Installer training and registration by System Supplier or a Certification Body
H.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		• Basic health and safety understanding of working on a cavity wall site	Installer H&S induction
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required: • VR450 Install Cavity Wall Insulation Further competencies required: • Trained by relevant system suppliers and in possession of current evidence of competence to install the relevant products or systems • Knowledge of the building type and loft construction concerned and the specific cavity wall insulation system proposed. • Storage and handling of materials • Suitability and preparation of the site • Understanding of the installation techniques and finishing work	1) NVQ Level 2 Certificate in Insulation and Building Treatments (Cavity Wall Insulation) SVQ in Insulation and Building Treatments (Cavity Wall Insulation) 2) System Supplier training and competence card

		• Understanding equipment specification and assembly instructions	
H.4	Current Competency	To be verified at interval no greater than annually	
H.5	Competence Ratio	Minimum of one carded operative per installation team (teams no greater than 3 in number)	
H.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	A copy of the Certificate under which the installer is operating shall be made available on request to the property owner.	
H.7	Health and safety considerations	Upon completion of the installation or at the end of each working day, if the installation takes longer than one day, the Operative shall investigate and confirm the proper functioning of all ventilation openings and flues in accordance with, for example the CIGA Operative's guide to best practice. The Operative shall complete a safety checklist for each installation *NOTE to H.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*	

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Cavity Wall Insulation</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Cavity Wall Insulation</td></tr>
<tr><td>H.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The requirements or guidance given in product manufacturers instructions

NOTE to K.1 Attention is drawn to the need for all cavity wall insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="6">H.2</td><td rowspan="6">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="5">The knowledge requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex CWI 1 - Install cavity wall insulation. Annex CWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Unit VR450 - Install cavity wall insulation

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annex CWI 1 to include the following route options:</td></tr>
<tr><td>1)

Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF unit <u>L/503/3070</u></td></tr>
<tr><td>2)

Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td>4)

Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex CWI 1</td></tr>
<tr><td></td><td>Operative threshold competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
</table>

		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence requirements	Route(s) to competence
		The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) where applicable to the scope of work undertaken: Annex CWI 1 - Install cavity wall insulation. Annex CWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Unit: VR450 - Install cavity wall insulation. In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex CWI 1 to include the following route options: 1) Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF unit L/503/3070 2) Completion of other aligned and accepted training and certification and on-site inspection of work 3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex CWI 1
H.4	Current Competency	Currency of competency in accordance with H.2 and H.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in H.2 and H3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to H.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
H.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section H.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of	

		all such work.
H.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom. • Information to inform the end user that the measure installed is controlled work under the Building Regulations and details of when and how the relevant local authority will be informed of the installation of the measure.
H.7	Health and safety considerations	Attention is drawn to the need for all cavity wall insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to H7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex I (normative)
Loft Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Loft Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Loft Insulation, taking account of the expert view submitted during this review.

Version 1

I.1 Additional installation requirements

When installing loft insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section I.1 of Table I.1 taking account of the health and safety considerations identified at I.7 and Annex AA.

I.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of loft insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of I.2 of Table I.1.

I.3 Operative competence

When installing loft insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in I.3 and I.4 of Table I.1 at the competency ratio specified in I.5.

I.4 Provision of information in respect of loft insulation

At the time of handover of the loft insulation to the customer, the installer shall ensure that the information identified at I.6 of Table I.1 is provided to the customer as part of the handover process required in **4.12.**

Table I.1 – Measure specific requirements for loft insulation

Measure	Loft Insulation
Product Category	Roll loft and blown loft insulation

I.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	Loft insulation installed shall be the subject of a current certificate awarded to a System Supplier against UK requirements and regulations. The Installer is responsible for: • Obtaining approval from the system supplier before an application for assessment/ certification is made to a certification body • Arranging for operatives to receive training from the system supplier to the competence level required to consistently install the loft insulation in accordance with the related certificate • Ensuring that specialist operatives (carded) undergo an on-site inspection by the system supplier, x times each calendar year • Ensuring that the Surveyors and Operatives meet the requirements of the System Supplier and this PAS Document • Maintaining the Certificate and installation manual for which the installer is approved • Maintaining records of all Surveyors and Operatives including dates of individual approval • Maintaining robust documentation identifying all work in progress and completed installations • Responding to the certification body for requests of ongoing and completed works and acting on any actions raised during an inspection and completing the required remedial works within a specific timescale • Monitoring and inspecting the Operatives on site to ensure they continually comply with the requirements of the PAS Document. • Maintaining technical support to the Surveyors and Operatives • Maintaining equipment maintenance schedules • Provision of an initial surveyors report that includes as a minimum: ○ The names of the Green Deal Installer, the Surveyor and Operative (if different from Surveyor) ○ The name and address of the customer and the location of the building ○ A signed declaration that the building has been assessed according to the requirements of the Certificate and the PAS document ○ Identification of essential ventilation openings that require safeguarding before installation ○ The position of all flues whether or not they are in service and measures that must be taken to safeguard their proper functioning *NOTE to I.1: Surveillance of training and installation work is carried out by Green Deal Inspectors, trained and experienced in the*

<table>
<tr><td></td><td></td><td colspan="2">technology, which ensures that the installing operatives are competent to install the related product or system in accordance with the relevant certificate.</td></tr>
<tr><td rowspan="2">I.2</td><td rowspan="2">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>• Knowledge of the building type and loft construction concerned and the specific loft insulation system proposed.
• Suitability of the site</td><td>Installer training and registration by System Supplier or a Certification Body</td></tr>
<tr><td rowspan="4">I.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>• Basic health and safety understanding of working on a loft insulation site</td><td>Installer H&S induction</td></tr>
<tr><td rowspan="2">Operative specialist competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required:
• VR451 Install Loft Insulation
Further competencies required:
• Trained by relevant system suppliers and in possession of current evidence of competence to install the relevant products or systems
• Knowledge of the building type and construction concerned plus the specific loft insulation system proposed
• Storage and handling of materials
• Suitability and preparation of the site
• Understanding of the installation techniques and finishing work
• Understanding equipment specification and assembly instructions</td><td>1)
NVQ Level 2 Certificate in Insulation and Building Treatments (Loft Insulation)
SVQ in Insulation and Building Treatments (Loft Insulation)
2)
System Supplier training and competence card</td></tr>
<tr><td>I.4</td><td>Current Competency</td><td colspan="2">To be verified at interval no greater than annually</td></tr>
</table>

I.5	Competence Ratio	Minimum of one carded operative per installation team (teams no greater than 3 in number)
I.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	A copy of the Certificate under which the installer is operating shall be made available on request to the property owner.
I.7	Health and safety considerations	Upon completion of the installation or at the end of each working day, if the installation takes longer than one day, the Operative shall investigate and confirm the proper functioning of all ventilation openings and flues. The Operative shall complete a safety checklist for each installation. *NOTE to I.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Loft Insulation</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Loft Insulation</td></tr>
<tr><td>I.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">i. The requirements or guidance given in product manufacturers instructions
ii. The guidance given in the Energy Efficiency Partnership for Homes publication ‘General Requirements and Guidance for the Installation of Loft Insulation’

NOTE to I.1 Attention is drawn to the need for all loft insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="6">I.2</td><td rowspan="6">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to demonstrating competence</td></tr>
<tr><td rowspan="5">The knowledge requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex LI 1 - Install loft wall insulation. Annex LI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR451 - Install loft insulation

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annex LI 1 to include the following route options:</td></tr>
<tr><td>1)

Relevant qualifications/qualification units and on-site inspection of work. For example QCF unit <u>F/503/3115</u></td></tr>
<tr><td>2)

Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td>4)

Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex LI 1</td></tr>
<tr><td></td><td>Operative threshold competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
</table>

		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence requirements	Route(s) to competence
		The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) where applicable to the scope of work undertaken: Annex LI 1 - Install loft insulation. Annex LI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR451 - Install loft insulation In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex CWI 1 to include the following route options:
			1) Relevant QCF qualifications/qualification units and on-site inspection of work For example QCF unit F/503/3115
			2) Completion of other aligned and accepted training and certification and on-site inspection of work
			3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work
			4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex LI 1
I.4	Current Competency	Currency of competency in accordance with I.2 and I.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in I.2 and I3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to I.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
I.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section I.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and	

		development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
I.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom.
I.7	Health and safety considerations	Attention is drawn to the need for all loft insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc 1074 *NOTE to I.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex J (normative)
Pitched Roof Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Pitched Roof Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Pitched Roof Insulation, taking account of the expert view submitted during this review.

Version 1

J.1 Additional installation requirements

When installing pitched roof insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section J.1 of Table J.1 taking account of the health and safety considerations identified at J.7 and Annex AA.

J.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of pitched roof insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of J.2 of Table J.1.

J.3 Operative competence

When installing pitched roof insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in J.3 and J.4 of Table J.1 at the competency ratio specified in J.5.

J.4 Provision of information in respect of pitched roof insulation

At the time of handover of the pitched roof insulation to the customer, the installer shall ensure that the information identified at J.6 of Table J.1 is provided to the customer as part of the handover process required in **4.12.**

Table J.1 – Measure specific requirements for pitched roof insulation

Measure	Pitched Roof Insulation
Product Category	Pitched Roof Insulation

J.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	Pitched roof insulation installation shall be the subject of a current certificate awarded to a System Supplier against UK requirements and regulations. The Installer is responsible for: • Obtaining approval from the system supplier before an application for assessment/ certification is made to a certification body • Arranging for operatives to receive training from the system supplier to the competence level required to consistently install the loft insulation in accordance with the related certificate • Ensuring that specialist operatives (carded) undergo an on-site inspection by the system supplier, x times each calendar year • Ensuring that the Surveyors and Operatives meet the requirements of the System Supplier and this PAS Document • Maintaining the Certificate and installation manual for which the installer is approved • Maintaining records of all Surveyors and Operatives including dates of individual approval • Maintaining robust documentation identifying all work in progress and completed installations • Responding to the certification body for requests of ongoing and completed works and acting on any actions raised during an inspection and completing the required remedial works within a specific timescale • Monitoring and inspecting the Operatives on site to ensure they continually comply with the requirements of the PAS Document. • Maintaining technical support to the Surveyors and Operatives • Maintaining equipment maintenance schedules • Provision of an initial surveyors report that includes as a minimum: o The names of the Green Deal Installer, the Surveyor and Operative (if different from Surveyor) o The name and address of the customer and the location of the building o A signed declaration that the building has been assessed according to the requirements of the Certificate and the PAS document o Identification of essential ventilation openings that require safeguarding before installation o The position of all flues whether or not they are in service and measures that must be taken to safeguard their proper functioning *NOTE to J.1 Surveillance of training and installation work is carried out by Green Deal Inspectors, trained and experienced in the*

<table>
<tr><td></td><td></td><td colspan="2">technology, which ensures that the installing operatives are competent to install the related product or system in accordance with the relevant certificate.</td></tr>
<tr><td rowspan="2">J.2</td><td rowspan="2">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>• Knowledge of the building type and loft construction concerned and the specific insulation system proposed
• Suitability and preparation of the site</td><td>Installer training and registration by System Supplier or a Certification Body</td></tr>
<tr><td rowspan="4">J.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>• Basic health and safety understanding of working on a pitched roof insulation site</td><td>Installer H&S induction</td></tr>
<tr><td rowspan="2">Operative specialist competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required:
• VR645 Install Insulation to Framed Sections of Buildings
Further competencies required:
• Trained by relevant system suppliers and in possession of current evidence of competence to install the relevant products or systems
• Knowledge of the building type concerned plus the specific insulation system proposed.
• Storage and handling of materials
• Suitability and preparation of the site
• Understanding of the installation techniques and finishing work
• Understanding equipment specification and assembly instructions</td><td>1)
NVQ Level 2 Certificate in Insulation and Building Treatments (Insulate Framed Sections of Buildings)
SVQ in Insulation and Building Treatments (Insulate Framed Sections of Buildings)
2)
System Supplier training and competence card</td></tr>
<tr><td>J.4</td><td>Current Competency</td><td colspan="2">To be verified at interval no greater than annually</td></tr>
<tr><td>J.5</td><td>Competence Ratio</td><td colspan="2">Minimum of one carded operative per installation team (teams no greater than 3 in number)</td></tr>
</table>

J.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	A copy of the Certificate under which the installer is operating shall be made available on request to the property owner.
J.7	Health and safety considerations	Upon completion of the installation or at the end of each working day, if the installation takes longer than one day, the Operative shall investigate and confirm the proper functioning of all ventilation openings and flues. The Operative shall complete a safety checklist for each installation *NOTE to J.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

Measure		Pitched roof Insulation	
Product Category			
J.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTE to I.1 Attention is drawn to the need for all pitched roof insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.*	
J.2	Surveyor competence requirements	Competence requirements	Route(s) to competence
		The knowledge requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken: Annex PRI 1 - Install pitched roof wall insulation. Annex PRI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex PRI 1 to include the following route options:
			1) Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916
			2) Completion of other aligned and accepted training and certification and on-site inspection of work
			3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work
			4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex PRI 1
	Operative threshold competence requirements	Competence requirements	Route(s) to competence

		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence requirements	Route(s) to competence
		The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) where applicable to the scope of work undertaken: Annex PRI 1 - Install pitched roof wall insulation. Annex PRI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex PRI 1 to include the following route options: 1) Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916 2) Completion of other aligned and accepted training and certification and on-site inspection of work 3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex PRI 1
J.4	Current Competency	Currency of competency in accordance with J.2 and J.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in J.2 and J.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to J.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
J.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section J.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the	

		work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
J.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom.
J.7	Health and safety considerations	Attention is drawn to the need for all pitched roof insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to J.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex K (normative)
Flat Roof Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Flat Roof Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Flat Roof Insulation, taking account of the expert view submitted during this review.

Version 1

K.1 Additional installation requirements

When installing flat roof insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section K.1 of Table K.1 taking account of the health and safety considerations identified at K.7 and Annex AA.

K.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of flat roof insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of K.2 of Table K.1.

K.3 Operative competence

When installing flat roof insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in K.3 and K.4 of Table K.1 at the competency ratio specified in K.5.

K.4 Provision of information in respect of flat roof insulation

At the time of handover of the flat roof insulation to the customer, the installer shall ensure that the information identified at K.6 of Table K.1 is provided to the customer as part of the handover process required in **4.12.**

Table K.1 – Measure specific requirements for flat roof insulation

Measure	Flat Roof Insulation
Product Category	Flat Roof Insulation

<table>
<tr><td>K.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The installer is responsible for
(Domestic) following the working instructions derived from a Competent Person Scheme under the Building Regulations for England and Wales, or equivalent.</td></tr>
<tr><td rowspan="2">K.2</td><td rowspan="2">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>Knowledge of the building type and construction concerned and the specific flat roof insulation system proposed</td><td>Installer training</td></tr>
<tr><td rowspan="4">K.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>Basic health and safety understanding of working on a flat roof site</td><td>Installer H&S induction</td></tr>
<tr><td rowspan="3">Operative specialist competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required, where relevant to the scope of the work being undertaken:
VR106 Prepare Decking for Built Up Bituminous Roofing
VR107 Apply Built Up Bituminous Roofing
VR108 Repair and Maintain Built Up Bituminous Roofing
Further competence required:
Knowledge of the building type concerned plus the specific insulation system proposed.</td><td>1)
NVQ Level 2 Certificate in Applied Waterproof Membranes. (Built Up Bituminous Roofing)
SVQ in Applied Waterproof Membranes (Built Up Bituminous Roofing)
2)
Alternative certification that has been mapped to the competence requirements within the specified National Occupational Standards that determine the competence required for the installation of Flat Roof Insulation.
3)
Experienced worker assessment conducted by an appropriate body against the competence requirements specified within the National Occupational Standards that determine the competence required for the installation of Flat Roof Insulation.</td></tr>
<tr><td>K.4</td><td>Current Competency</td><td colspan="2">To be verified at interval no greater than annually</td></tr>
</table>

K.5	Competence Ratio	A minimum of one specialist operative for every three operatives on site per installation
K.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	No specific requirement
K.7	Health and safety considerations	*NOTE to K.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Flat roof Insulation</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Flat roof Insulation</td></tr>
<tr><td>K.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The requirements or guidance given in product manufacturers instructions

NOTE to K.1 Attention is drawn to the need for all flat roof insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="5">K.2</td><td rowspan="5">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="4">The knowledge requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex FRI 1 - Install flat roof insulation. Annex FRI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace

VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annex FRI 1 to include the following route options:</td></tr>
<tr><td>1)

Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916</td></tr>
<tr><td>2)

Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td>4)

Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex FRI 1</td></tr>
</table>

<table>
<tr><td rowspan="10">K.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td>No specific threshold requirements</td><td>Not applicable</td></tr>
<tr><td rowspan="8">Operative specialist competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="7">The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex FRI 1 - Install flat roof insulation. Annex FRI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace

VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annex FRI 1 to include the following route options:</td></tr>
<tr><td>1)

Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916</td></tr>
<tr><td>2)

Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td>4)

Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex FRI 1</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>K.4</td><td>Current Competency</td><td colspan="2">Currency of competency in accordance with K.2 and K.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in K.2 and K.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced.

NOTE to K.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.</td></tr>
<tr><td>K.5</td><td>Competence Ratio</td><td colspan="2">Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2</td></tr>
</table>

		Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section K.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
K.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom.
K.7	Health and safety considerations	Attention is drawn to the need for all flat roof insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to K.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex L (normative)
Internal Wall Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Internal Wall Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Internal Wall Insulation, taking account of the expert view submitted during this review.

Version 1

L.1 Additional installation requirements

When installing internal wall insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section L.1 of Table L.1 taking account of the health and safety considerations identified at L.7 and Annex AA.

L.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of internal wall insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of L.2 of Table L.1.

L.3 Operative competence

When installing internal wall insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in L.3 and L.4 of Table L.1 at the competency ratio specified in L.5.

L.4 Provision of information in respect of internal wall insulation

At the time of handover of the internal wall insulation to the customer, the installer shall ensure that the information identified at L.6 of Table L.1 is provided to the customer as part of the handover process required in **4.12.**

Table L.1 – Measure specific requirements for internal wall insulation

Measure	Internal Wall Insulation
Product Category	Internal Wall Insulation

L.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	Internal wall insulation installed shall be the subject of a current IWI system certificate awarded to a System Supplier against UK requirements and regulations. The Installer is responsible for: • Ensuring that the Surveyors and Operatives meet the requirements of the System Supplier and this PAS Document • Obtaining approval from the system supplier before an application for assessment/ certification is made to a certification body • Arranging for operatives to receive training from the system supplier to the competence level required to consistently install the internal wall insulation in accordance with the related certificate • Ensuring that specialist operatives (carded) undergo an on-site inspection by the system supplier, x times each calendar year • Obtaining a copy from the system supplier of the installation Method Statement agreed between the System Supplier and the Inspection Body, covering all aspects of the installation process, from initial survey to hand over process and maintenance requirements. • Being fully conversant with the contents and requirements in the agreed installation Method Statement, including: o The detailed project specification o Storage and handling of materials o Access requirements o Suitability and preparation of the substrate (including general suitability for the system and may include pull-out or pull-off testing for Internal systems) o Installation techniques o Repair and maintenance o Communication of inspection and maintenance requirements to the building end user or management company o Project record keeping o Ensuring that the following items are documented and made available to the Operative for each specific installation: o Method statements o The assessment report o Any special instructions to the Operative relating to time, access and services needed

		○ The completed risk assessment and any instructions/actions that need to be followed • Maintaining the Certificate and installation manual for which the installer is approved • Maintaining records of all Surveyors and Operatives including dates of individual approval • Maintaining robust documentation identifying all work in progress and completed installations • Responding to the certification body for requests of ongoing and completed works and acting on any actions raised during an inspection and completing the required remedial works within a specific timescale • Monitoring and inspecting the Operatives on site to ensure they continually comply with the requirements of the PAS Document. • Requirements for fire stopping • Design requirements for reducing thermal bridging/ensuring continuity of insulation and assessment of condensation risk • Collecting the sign off sheets completed by the operative for each of the key installation stages: ○ Checking continuity of insulation ○ Checking fire breaks ○ Checking seals and openings ○ Checking fixings are installed correctly • Provision of an initial surveyors report that includes as a minimum: ○ The names of the Green Deal Installer, the Surveyor and Operative (if different from Surveyor) ○ The name and address of the customer and the location of the building ○ A signed declaration that the building has been assessed according to the requirements of the Certificate and the PAS document ○ The specification of any remedial action that will be required before the installation of the system. The responsibility for rectification shall be identified at the time of noting such actions ○ Requirements for and locations of fire stopping ○ The need for substrate pull-out or pull-off tests and other substrate preparation ○ Condensation risk assessment ○ Any special requirements / factors for a particular installation

		○ Further technical investigations undertaken *NOTE to L.1 Surveillance of training and installation work is carried out by Green Deal Inspectors, trained and experienced in the technology, which ensures that the installing operatives are competent to install the related system in accordance with the relevant certificate.*	
L.2	Surveyor competence requirements	Competence required	Route(s) to competence
		• Knowledge of the building type concerned and the specific IWI system proposed. • Suitability of the site	Installer training and registration by System Supplier or a Certification Body
L.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		• Basic health and safety understanding of working on an internal wall site	Installer H&S induction
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required: • VR644 Install Internal Insulation to Walls, Floors and Ceilings Further competencies required: • Trained by relevant system suppliers and in possession of current evidence of competence to install the relevant products or systems • Knowledge of the building type and wall construction concerned plus the specific IWI system proposed and key stage completion requirements. • Storage and handling of materials • Suitability and preparation of the site • Understanding of the installation techniques and finishing work	1) NVQ Level 2 Certificate in Insulation and Building Treatments (Internal Insulation) SVQ in Insulation and Building Treatments (Internal Insulation) 2) System Supplier / SWIGA training and competence card
L4	Current Competency	To be verified at interval no greater than annually	

L5	Competence Ratio	Minimum of one carded operative per installation team (teams no greater than 3 in number). At least one competent and carded Operative shall be present on site for each stage of the installation (e.g. setting out, finishing, etc).
L6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	A copy of the Certificate under which the installer is operating shall be made available on request to the property owner.
L.7	Health and safety considerations	*NOTE to L.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Internal Wall Insulation</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Internal Wall Insulation</td></tr>
<tr><td>L.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The requirements or guidance given in product manufacturers instructions

NOTE to L.1 Attention is drawn to the need for all internal wall insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="5">L.2</td><td rowspan="5">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="4">The knowledge requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex IWI 1 - Install internal wall insulation. Annex IWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace

VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annexe IWI 1 to include the following route options:</td></tr>
<tr><td>1)
Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916</td></tr>
<tr><td>2)
Completion of other aligned and accepted training and certification and on-site inspection of work.</td></tr>
<tr><td>3)
Membership of a Building Regulations Competent Person Scheme and on-site inspection of work.</td></tr>
<tr><td>4)
Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex IWI 1</td></tr>
<tr><td></td><td>Operative threshold competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
</table>

<table>
<tr><td></td><td></td><td>No specific threshold requirements</td><td>Not applicable</td></tr>
<tr><td></td><td>Operative specialist competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td></td><td></td><td rowspan="4">The competence requirements defined in the following Common Minimum Technical Competence Annexes as applicable to the scope of work undertaken:

Annex IWI 1 - Install internal wall insulation. Annex IWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace

VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annexes EWI 1 and EWI 2 to include the following route options:</td></tr>
<tr><td></td><td></td><td>1)

Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916</td></tr>
<tr><td></td><td></td><td>2)

Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td></td><td></td><td>3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td></td><td></td><td></td><td>4)

Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex IWI 1</td></tr>
<tr><td>L.4</td><td>Current Competency</td><td colspan="2">Currency of competency in accordance with L.2 and L 3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in L.2 and L 3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced.

NOTE to L.4 The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.</td></tr>
<tr><td>L.5</td><td>Competence Ratio</td><td colspan="2">Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2

Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section K.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the</td></tr>
</table>

		work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
L.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Details of any precautions to be taken or actions to be avoided to prevent damage to the installed internal wall insulation or the surface finish of the internal wall insulation • Details of maintenance requirements and details of what maintenance is only to be carried out by competent persons • Where end user maintenance possible, details how to undertake the maintenance including details of any product or tools that must be used and details of where to obtain the required products and tools. • Details of maintenance services available (if any)
L.7	Health and safety considerations	Attention is drawn to the need for all internal wall insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to L.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex M (normative)
External Wall Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the External Wall Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for External Wall Insulation, taking account of the expert view submitted during this review.

Version 1

M.1 Additional installation requirements

When installing external wall insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section M.1 of Table M.1 taking account of the health and safety considerations identified at M.7 and Annex AA.

M.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of external wall insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of M2 of Table M1.

M.3 Operative competence

When installing external wall insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in M3 and M4 of Table M1 at the competency ratio specified in M5.

M.4 Provision of information in respect of external wall insulation

At the time of handover of the external wall insulation to the customer, the installer shall ensure that the information identified at M6 of Table M1 is provided to the customer as part of the handover process required in **4.12.**

Table M.1 – Measure specific requirements for external wall insulation

Measure	External Wall Insulation
Product Category	External Wall Insulation

M.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	External wall insulation installation shall be the subject of a current certificate awarded to a System Supplier against UK requirements and regulations. The Installer is responsible for: • Ensuring that the Surveyors and Operatives meet the requirements of the System Supplier and this PAS Document • Obtaining approval from the system supplier before an application for assessment/ certification is made to a certification body • Arranging for operatives to receive training from the system supplier to the competence level required to consistently install the external wall insulation in accordance with the related certificate • Ensuring that specialist operatives (carded) undergo an on-site inspection by the system supplier, x times each calendar year • Obtaining a copy from the system supplier of the installation Method Statement agreed between the System Supplier and the Inspection Body, covering all aspects of the installation process, from initial survey to hand over process and maintenance requirements. • Being fully conversant with the contents and requirements in the agreed installation Method Statement, including: o The detailed project specification o Storage and handling of materials o Access requirements o Suitability and preparation of the substrate (including general suitability for the system and may include pull-out or pull-off testing for Internal systems) o Installation techniques o Repair and maintenance o Communication of inspection and maintenance requirements to the building end user or management company o Project record keeping o Ensuring that the following items are documented and made available to the Operative for each specific installation: o Method statements o The assessment report o Any special instructions to the Operative relating to time, access and services needed

		○ The completed risk assessment and any instructions/actions that need to be followed • Maintaining the Certificate and installation manual for which the installer is approved • Maintaining records of all Surveyors and Operatives including dates of individual approval • Maintaining robust documentation identifying all work in progress and completed installations • Responding to the certification body for requests of ongoing and completed works and acting on any actions raised during an inspection and completing the required remedial works within a specific timescale • Monitoring and inspecting the Operatives on site to ensure they continually comply with the requirements of the PAS Document. • Requirements for fire stopping • Design requirements for reducing thermal bridging/ensuring continuity of insulation and assessment of condensation risk • Collecting the sign off sheets completed by the operative for each of the key installation stages: ○ Checking continuity of insulation ○ Checking fire breaks ○ Checking seals and openings ○ Checking fixings are installed correctly • Provision of an initial surveyors report that includes as a minimum: ○ The names of the Green Deal Installer, the Surveyor and Operative (if different from Surveyor) ○ The name and address of the customer and the location of the building ○ A signed declaration that the building has been assessed according to the requirements of the Certificate and the PAS document ○ The specification of any remedial action that will be required before the installation of the system. The responsibility for rectification shall be identified at the time of noting such actions ○ Requirements for and locations of fire stopping ○ The need for substrate pull-out or pull-off tests and other substrate preparation ○ Any special requirements / factors for a particular installation ○ Further technical investigations undertaken *NOTE to M.1 Surveillance of training and installation work is carried out by Green Deal Inspectors, trained and experienced in the*

		technology, which ensures that the installing operatives are competent to install the related product or system in accordance with the relevant certificate.	
M.2	Surveyor competence requirements	Competence required	Route(s) to competence
		Knowledge of the building type concerned and the specific EWI system proposed	Installer training and registration by System Supplier or a Certification Body
M.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		• Basic health and safety understanding of working on an external wall site	Installer H&S induction
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required: • VR448 Install External Wall Insulation Further competencies required: • Trained by relevant system suppliers and in possession of current evidence of competence to install the relevant products or systems • Knowledge of the building type and wall construction concerned plus the specific EWI system proposed and key stage completion requirements. • Storage and handling of materials • Suitability and preparation of the site • Understanding of the installation techniques and finishing work	1) NVQ Level 2 Certificate in Insulation and Building Treatments (External Wall Insulation) SVQ in Insulation and Building Treatments (External Wall Insulation) 2) System Supplier / SWIGA training and competence card
M.4	Current Competency	To be verified at interval no greater than annually	
M.5	Competence Ratio	Minimum of one carded operative per installation team (teams no greater than 3 in number). At least one competent and carded	

		Operative shall be present on site for each stage of the installation (e.g. setting out, finishing, etc).
M.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	Owner's maintenance manual A copy of the Certificate under which the installer is operating shall be made available on request to the property owner.
M.7	Health and safety considerations	*NOTE to M.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

Measure		External Wall Insulation	
Product Category		External Wall Insulation	
M.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions The guidance provided within the UK annex of the European Association for External Thermal Insulation Composite Systems, European Guideline for the application of ETICS *NOTE to K.1 Attention is drawn to the need for all external wall insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.*	
M.2	Surveyor competence requirements	Competence required	Route(s) to competence
		The knowledge requirements as defined in the following Common Minimum Technical Competence Annexes <u>where applicable</u> to the scope of work undertaken: Annex EWI 1 - Install external wall insulation. Annex EWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR448 - Install external wall insulation Annex EWI 2 - Apply Surface Finishes to External Wall Insulation. Annex EWI 2 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR449 – Apply Surface Finishes to External Wall Insulation In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annexes EWI 1 and EWI 2 to include the following route options: 1) Relevant qualifications/qualification units and on-site inspection of work. For example QCF units H/503/3026, D/503/3042 2) Completion of other aligned and accepted training and certification and on-site inspection of work 3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to

			the competences stated in Annex EWI 1 and EWI 2
M.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence required	Route(s) to competence
		The competencies defined in the following Common Minimum Technical Competence Annexes as applicable to the scope of work undertaken: Annex EWI 1 - Install external wall insulation. Annex EWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR448 - Install external wall insulation Annex EWI 2 - Apply Surface Finishes to External Wall Insulation. Annex EWI 2 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR449 – Apply Surface Finishes to External Wall Insulation In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annexes EWI 1 and EWI 2 to include the following route options: 1) Relevant qualifications/qualification units and on-site inspection of work. For example QCF units H/503/3026, D/503/3042 2) Completion of other aligned and accepted training and certification and on-site inspection of work 3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex EWI 1 and EWI 2
M.4	Current Competency	Currency of competency in accordance with M.2 and M.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in M.2 and M.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
M.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2	

		Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section M.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
M.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	• Any manufacturer or product data or information sheets • Details of any precautions to be taken or actions to be avoided to prevent damage to the installed external wall insulation or the surface finish of the external wall insulation • Details of maintenance requirements and details of what maintenance is only to be carried out by competent persons • Where end user maintenance possible, details how to undertake the maintenance including details of any product or tools that must be used and details of where to obtain the required products and tools. • Details of maintenance services available (if any)
M.7	Health and safety considerations	Attention is drawn to the need for all external wall insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to M.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex N (normative)
Hybrid Wall Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Hybrid Wall Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Hybrid Wall Insulation, taking account of the expert view submitted during this review.

Version 1

N.1 Additional installation requirements

When installing hybrid wall insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section N.1 of Table N.1 taking account of the health and safety considerations identified at N.7 and Annex AA.

N.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of hybrid wall insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of N2 of Table N1.

N.3 Operative competence

When installing hybrid wall insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in N3 and N4 of Table N1 at the competency ratio specified in N5.

N.4 Provision of information in respect of hybrid wall insulation

At the time of handover of hybrid wall insulation to the customer, the installer shall ensure that the information identified at N.6 of Table N1 is provided to the customer as part of the handover process required in **4.12.**

Table N.1 – Measure specific requirements for hybrid wall insulation

Measure	Hybrid Wall Insulation
Product Category	Hybrid Wall Insulation

N.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	Hybrid wall insulation installation shall be the subject of a current certificate awarded to a System Supplier against UK requirements and regulations, The Installer is responsible for: • Ensuring that the Surveyors and Operatives meet the requirements of the System Supplier and this PAS Document • Obtaining approval from the system supplier before an application for assessment/ certification is made to a certification body • Arranging for operatives to receive training from the system supplier to the competence level required to consistently install the hybrid wall insulation in accordance with the related certificate • Ensuring that specialist operatives (carded) undergo an on-site inspection by the system supplier, x times each calendar year • Obtaining a copy from the system supplier of the installation Method Statement agreed between the System Supplier and the Inspection Body, covering all aspects of the installation process, from initial survey to hand over process and maintenance requirements. • Being fully conversant with the contents and requirements in the agreed installation Method Statement, including: o The detailed project specification o Storage and handling of materials o Access requirements o Suitability and preparation of the substrate (including general suitability for the system and may include pull-out or pull-off testing for Internal systems) o Installation techniques o Repair and maintenance o Communication of inspection and maintenance requirements to the building end user or management company o Project record keeping o Ensuring that the following items are documented and made available to the Operative for each specific installation: o Method statements o The assessment report o Any special instructions to the Operative relating to time, access and services needed

		○ The completed risk assessment and any instructions/actions that need to be followed • Maintaining the Certificate and installation manual for which the installer is approved • Maintaining records of all Surveyors and Operatives including dates of individual approval • Maintaining robust documentation identifying all work in progress and completed installations • Responding to the certification body for requests of ongoing and completed works and acting on any actions raised during an inspection and completing the required remedial works within a specific timescale • Monitoring and inspecting the Operatives on site to ensure they continually comply with the requirements of the PAS Document. • Requirements for fire stopping • Design requirements for reducing thermal bridging/ensuring continuity of insulation and assessment of condensation risk • Collecting the sign off sheets completed by the operative for each of the key installation stages: ○ Checking continuity of insulation ○ Checking fire breaks ○ Checking seals and openings ○ Checking fixings are installed correctly • Provision of an initial surveyors report that includes as a minimum: ○ The names of the Green Deal Installer, the Surveyor and Operative (if different from Surveyor) ○ The name and address of the customer and the location of the building ○ A signed declaration that the building has been assessed according to the requirements of the Certificate and the PAS document ○ The specification of any remedial action that will be required before the installation of the system. The responsibility for rectification shall be identified at the time of noting such actions ○ Requirements for and locations of fire stopping ○ The need for substrate pull-out or pull-off tests and other substrate preparation ○ Any special requirements / factors for a particular installation ○ Further technical investigations undertaken *NOTE to N.1 Surveillance of training and installation work is carried out by Green Deal Inspectors, trained and experienced in the*

		technology, which ensures that the installing operatives are competent to install the related product or system in accordance with the relevant certificate.	
N.2	Surveyor competence requirements	Competence required	Route(s) to competence
		• Knowledge of the building type concerned and the specific HWI system proposed • Suitability of the site	Installer training and registration by System Supplier or a Certification Body
N.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		• Basic health and safety understanding of working on a Hybrid wall site	Installer H&S induction
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required: • VR644 Install Internal Insulation to Walls, Floors and Ceilings • VR645 Install Insulation to Framed Sections of Buildings Further competencies required: • Trained by relevant system suppliers and in possession of current evidence of competence to install the relevant products or systems • Knowledge of the building type and wall construction concerned plus the specific HWI system proposed and key stage completion requirements. • Storage and handling of materials • Suitability and preparation of the site • Understanding of the installation techniques and finishing	1) NVQ Level 2 Certificate in Insulation and Building Treatments (Internal Insulation) SVQ in Insulation and Building Treatments (Internal Insulation) Or NVQ Level 2 Certificate in Insulation and Building Treatments (Insulate Framed Sections of Buildings) SVQ in Insulation and Building Treatments (Insulate Framed Sections of Buildings) 2) System Supplier / SWIGA training and competence card

		work	
N.4	Current Competency	To be verified at interval no greater than annually	
N.5	Competence Ratio	Minimum of one carded operative per installation team (teams no greater than 3 in number). At least one competent and carded Operative shall be present on site for each stage of the installation (e.g. setting out, finishing, etc).	
N.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	Owner's maintenance manual A copy of the Certificate under which the installer is operating shall be made available on request to the property owner.	
N.7	Health and safety considerations	*NOTE to N.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*	

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Hybrid Wall Insulation</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Hybrid Wall Insulation</td></tr>
<tr><td>N.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The requirements or guidance given in product manufacturers instructions
The guidance provided with the European Association for External Thermal Insulation Composite Systems, European Guideline for the application of ETICS

NOTE to M.1 Attention is drawn to the need for all hybrid wall insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="4">N.2</td><td rowspan="4">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td>The competencies defined in the following Common Minimum Technical Competence Annexes as applicable to the scope of work undertaken:

Annex IWI 1 - Install internal wall insulation. Annex IWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace

VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace

Annex EWI 1 - Install External Wall Insulation. Annex EWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR448 - Install External Wall Insulation</td><td>As defined within Common Minimum Technical Competence Annexes IWI , EWI 1 and EWI 2 to include the following route options:

1)

Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916, H/503/3026, D/503/3042

2)

Completion of other aligned and accepted training and certification and on-site inspection of work

3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
</table>

		Annex EWI 2 - Apply Surface Finishes to External Wall Insulation. Annex EWI 2 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR449 – Apply Surface Finishes to External Wall Insulation In addition, any product specific training and/or competence requirements specified by the product manufacturer.	4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex IWI , EWI 1 and EWI 2
N.3	Operative threshold competence requirements	Competence requirements	Route(s) to competence
		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence requirements	Route(s) to competence
		The competencies defined in the following Common Minimum Technical Competence Annexes as applicable to the scope of work undertaken: Annex IWI 1 - Install internal wall insulation. Annex IWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace VR645 - Installing Insulation to Framed Sections of Buildings in the Workplace Annex EWI 1 - Install External Wall Insulation. Annex EWI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR448 - Install External Wall Insulation Annex EWI 2 - Apply Surface Finishes to External Wall Insulation. Annex EWI 2 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:	As defined within Common Minimum Technical Competence Annexes IWI , EWI 1 and EWI 2 to include the following route options: 1) Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886, T/503/2916, H/503/3026, D/503/3042 2) Completion of other aligned and accepted training and certification and on-site inspection of work 3) Membership of a Building Regulations Competent Person Scheme + on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex IWI , EWI 1 and EWI 2

		VR449 – Apply Surface Finishes to External Wall Insulation In addition, any product specific training and/or competence requirements specified by the product manufacturer.	
N.4	Current Competency	Currency of competency in accordance with N.2 and N 3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in N.2 and N 3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to N.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
N.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section N.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
N.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Details of any precautions to be taken or actions to be avoided to prevent damage to the installed hybrid wall insulation or the surface finish of the hybrid wall insulation • Details of maintenance requirements and details of what maintenance is only to be carried out by competent persons • Where end user maintenance possible, details how to undertake the maintenance including details of any product or tools that must be used and details of where to obtain the required products and tools. • Details of maintenance services available (if any)	
N.7	Health and safety considerations	Attention is drawn to the need for all hybrid wall insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to N.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*	

Annex O (normative)
Draught Proofing

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Draught Proofing annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Draught Proofing, taking account of the expert view submitted during this review.

Version 1

O.1 Additional installation requirements

When installing draught proofing, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section O.1 of Table O.1 taking account of the health and safety considerations identified at O.7 and Annex AA.

O.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of draught proofing, the installer shall employ or contract only a surveyor meeting the competence requirements of O2 of Table O1.

O.3 Operative competence

When installing draught proofing, the installer shall employ or contract only operatives meeting the competency requirements set out in O3 and O.4 of Table O.1 at the competency ratio specified in O.5.

O.4 Provision of information in respect of draught proofing

At the time of handover of the draught proofing to the customer, the installer shall ensure that the information identified at O.6 of Table O.1 is provided to the customer as part of the handover process required in **4.12.**

Table O.1 – Measure specific requirements for draught proofing

Measure	Draught Proofing
Product Category	Draught Proofing

<table>
<tr><td>O.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The Installer is responsible for:
Ensuring that the Surveyors and Operatives meet the requirements of the manufacturer or the System Supplier and this PAS Document
Consulting and where appropriate following guidelines from the manufacturer or System supplier on the effective installation of draught proofing</td></tr>
<tr><td rowspan="2">O.2</td><td rowspan="2">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>Knowledge of the building type concerned and the specific draught proofing system proposed
Suitability of the site</td><td>Installer training</td></tr>
<tr><td rowspan="4">O.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>Basic health and safety understanding</td><td>Installer H&S induction</td></tr>
<tr><td rowspan="2">Operative specialist competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required:
VR452 Install Draught-proofing to Openings
Further competencies required:
Knowledge of the building type concerned plus the specific insulation system proposed.</td><td>1)
NVQ Level 2 Diploma in Insulation and Building Treatments (Draught-proofing)
SVQ in Insulation and Building Treatments (Draught-proofing)
2)
Alternative certification that has been mapped to the competence requirements within the specified National Occupational Standards that determine the competence required for the installation of Draught Proofing.
3)
Experienced worker assessment conducted by an appropriate body against the competence requirements specified within the National Occupational Standards that determine the competence required for the installation of Draught Proofing.</td></tr>
<tr><td>O.4</td><td>Current Competency</td><td colspan="2">To be verified every 5 years</td></tr>
</table>

O.5	Competence Ratio	Minimum of one specialist operative per installation team
O.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	None
O.7	Health and safety considerations	*NOTE to O.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Draught proofing</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Draught proofing</td></tr>
<tr><td>O.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The requirements or guidance given in product manufacturers instructions

NOTE to O.1 Attention is drawn to the need for all draught proofing work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="5">O.2</td><td rowspan="5">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="4">The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex DP 1 - Install draught proofing. Annex DP 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR452 - Installing Draught-proofing to Openings in the Workplace

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annex DP 1 to include the following route options:</td></tr>
<tr><td>1)

Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF unit L/503/3117</td></tr>
<tr><td>2)

Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)

Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td>4)

Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to</td></tr>
</table>

			the competences stated in Annex DP 1
O.3	Operative threshold competence requirements	Competence requirements	Route(s) to competence
		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence requirements	Route(s) to competence
		The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) where applicable to the scope of work undertaken: Annex DP 1 - Install draught proofing. Annex DP 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR452 - Installing Draught-proofing to Openings in the Workplace In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex DP 1 to include the following route options: 1) Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF unit L/503/3117 2) Completion of other aligned and accepted training and certification and on-site inspection of work. 3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex DP 1
O.4	Current Competency	Currency of competency in accordance with O.2 and O.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in O.2 and O.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to O.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	

O.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section O.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
O.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom.
O.7	Health and safety considerations	Attention is drawn to the need for all draught proofing work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to O.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex P (normative)
Floor Insulation

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Floor Insulation annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Floor Insulation, taking account of the expert view submitted during this review.

Version 1

P.1 Additional installation requirements

When installing floor insulation, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section P.1 of Table P.1 taking account of the health and safety considerations identified at P.7 and Annex AA.

P.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of floor insulation, the installer shall employ or contract only a surveyor meeting the competence requirements of P2 of Table P.1.

P.3 Operative competence

When installing floor insulation, the installer shall employ or contract only operatives meeting the competency requirements set out in P.3 and P.4 of Table P.1 at the competency ratio specified in P.5.

P.4 Provision of information in respect of floor insulation

At the time of handover of the floor insulation to the customer, the installer shall ensure that the information identified at P.6 of Table P.1 is provided to the customer as part of the handover process required in **4.12.**

Table P.1 – Measure specific requirements for floor insulation

Measure	Floor Insulation
Product Category	Floor Insulation

P.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The Installer is responsible for: • Ensuring that the Surveyors and Operatives meet the requirements of the manufacturer or the System Supplier and this PAS Document • Consulting and where appropriate following guidelines from the manufacturer or System supplier on the effective installation of floor insulation	
P.2	Surveyor competence requirements	Competence required	Route(s) to competence
		• Knowledge of the building type concerned and the specific floor insulation system proposed • Suitability of the site	Installer training
P.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		• Basic health and safety understanding	Installer H&S induction
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required: • VR644 Install Internal Insulation to Walls, Floors and Ceilings Further competencies required: • Knowledge of the building type concerned plus the specific floor insulation system proposed • Storage and handling of materials • Suitability and preparation of the site • Understanding of the installation techniques and finishing work	1) NVQ Level 2 Certificate in Insulation and Building Treatments (Internal Insulation) 2) Alternative certification that has been mapped to the competence requirements within the specified National Occupational Standards that determine the competence required for the installation of Floor Insulation. 3) Experienced worker assessment conducted by an appropriate body against the competence requirements specified within the National Occupational Standards that determine the competence required for the installation of Floor Insulation.
P.4	Current Competency	To be verified every 5 years	
P.5	Competence Ratio	Minimum of one specialist operative per installation team	
P.6	Measure specific Information to	None	

	be handed-over to the customer in accordance with 4.12.	
P.7	Health and safety considerations	*NOTE to P.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

Measure		Floor Insulation	
Product Category		Floor Insulation	
P.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTE to P.1 Attention is drawn to the need for all floor insulation work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.*	
P 2	Surveyor competence requirements	Competence requirements	Route(s) to competence
		The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) where applicable to the scope of work undertaken: Annex FI 1 - Install floor insulation. Annex FI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units: VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex FRI 1 to include the following route options: 1) Relevant qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886 2) Completion of other aligned and accepted training and certification and on-site inspection of work 3) Membership of a Building Regulations Competent Person Scheme and on-site inspection of work 4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex FRI 1
P.3	Operative threshold competence requirements	Competence requirements	Route(s) to competence
		No specific threshold requirements	Not applicable

<table>
<tr><td></td><td>Operative specialist competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="5"></td><td rowspan="5"></td><td rowspan="5">The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) <u>where applicable</u> to the scope of work undertaken:

Annex FI 1 - Install floor insulation. Annex FI 1 to be derived from and cross-referenced to, the following ConstructionSkills National Occupational Standard Units:

VR644 - Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>As defined within Common Minimum Technical Competence Annex FI 1 to include the following route options:</td></tr>
<tr><td>1)
Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF units J/503/2886</td></tr>
<tr><td>2)
Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)
Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td>4)
Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex FI 1</td></tr>
<tr><td>P.4</td><td>Current Competency</td><td colspan="2">Currency of competency in accordance with P.2 and P.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in P.2 and P.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced.

NOTE to P.4 : The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.</td></tr>
<tr><td>P.5</td><td>Competence Ratio</td><td colspan="2">Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2

Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section P.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of</td></tr>
</table>

		all such work.
P.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom.
P.7	Health and safety considerations	Attention is drawn to the need for all floor insulation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to P.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex Q (normative)
Heating System Insulation (pipes and cylinders)

Q.1 Additional installation requirements

When installing heating system insulation (pipes and cylinders), in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section Q.1 of Table Q.1 taking account of the health and safety considerations identified at Q.7 and Annex AA.

Q.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of heating system insulation (pipes and cylinders), the installer shall employ or contract only a surveyor meeting the competence requirements of Q2 of Table Q.1.

Q.3 Operative competence

When installing heating system insulation (pipes and cylinders), the installer shall employ or contract only operatives meeting the competency requirements set out in Q.3 and Q.4 of Table Q.1 at the competency ratio specified in Q.5.

Q.4 Provision of information in respect of heating system insulation (pipes and cylinders)

At the time of handover of the heating system insulation (pipes and cylinders) to the customer, the installer shall ensure that the information identified at Q.6 of Table Q.1 is provided to the customer as part of the handover process required in **4.12.** .

Table Q.1 – Measure specific requirements for heating system insulation (pipes and cylinders)

Measure		Heating System Insulation (pipes and cylinders)	
Product Category		Heating System Insulation (pipes and cylinders)	
Q.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The Installer is responsible for: • Ensuring that the Surveyors and Operatives meet the requirements of the manufacturer or System Supplier and this PAS Document • Consulting and where appropriate following guidelines from the manufacturer or System supplier on the effective installation of heating system insulation	
Q.2	Surveyor competence requirements	Competence required	Route(s) to competence
		• Knowledge of the building type concerned and the	Installer training

<table>
<tr><td></td><td></td><td>specific heating system insulation system proposed
• Suitability of the site</td><td></td></tr>
<tr><td rowspan="5">Q.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>• Basic health and safety understanding</td><td>Installer H&S induction</td></tr>
<tr><td rowspan="3">Operative specialist competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="2">In addition to the above threshold competence, specialist operative competence based on the following National Occupational Standards is required:
• VR451 Install Loft Insulation
Further competencies required:
• Knowledge of the specific heating system insulation system proposed
• Storage and handling of materials
• Suitability and preparation of the site
• Understanding of the installation techniques and finishing work</td><td>1)
NVQ Level 2 Certificate in Insulation and Building Treatments (Loft Insulation)
SVQ in Insulation and Building Treatments (Loft Insulation)
2)
Alternative certification that has been mapped to the competence requirements within the specified National Occupational Standards that determine the competence required for the installation of Heating System Insulation.
3)
Experienced worker assessment conducted by an appropriate body against the competence requirements specified within the National Occupational Standards that determine the competence required for the installation of Heating System Insulation.</td></tr>
<tr><td></td></tr>
<tr><td>Q.4</td><td>Current Competency</td><td colspan="2">To be verified every 5 years</td></tr>
<tr><td>Q.5</td><td>Competence Ratio</td><td colspan="2">Minimum of one specialist operative per installation team</td></tr>
<tr><td>Q.6</td><td>Measure specific Information to be handed-over to the customer in accordance with 4.12.</td><td colspan="2">None</td></tr>
<tr><td>Q.7</td><td>Health and safety considerations</td><td colspan="2">NOTE to Q.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.</td></tr>
</table>

Annex R (normative)
Energy Efficient Glazing and Doors

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Energy Efficient Glazing and Doors annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Energy Efficient Glazing and Doors, taking account of the expert view submitted during this review.

Version 1

R.1 Additional installation requirements

When installing energy efficient glazing and doors, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section R.1 of Table R.1 taking account of the health and safety considerations identified at R.7 and Annex AA.

R.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of energy efficient glazing and doors, the installer shall employ or contract only a surveyor meeting the competence requirements of R2 of Table R.1.

R.3 Operative competence

When installing energy efficient glazing and doors, the installer shall employ or contract only operatives meeting the competency requirements set out in R.3 and R.4 of Table R.1 at the competency ratio specified in R.5.

R.4 Provision of information in respect of energy efficient glazing and doors

At the time of handover of the energy efficient glazing and doors to the customer, the installer shall ensure that the information identified at R.6 of Table R.1 is provided to the customer as part of the handover process required in **4.12.**

Table R.1 – Measure specific requirements for energy efficient glazing and doors

Measure	Energy Efficient Glazing and Doors
Product Category	Energy Efficient Glazing and Doors

<table>
<tr><td>R.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">None</td></tr>
<tr><td rowspan="4">R.2</td><td rowspan="4">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="3">• Identifying all fenestration installation requirements
• Producing specifications for window and door installations
• Communicating and working with others in the glass and related working environments</td><td>1)
GQA Level 3 NVQ Certificate in fenestration surveying (QCF)</td></tr>
<tr><td>2)
Member of a Competent Person Scheme</td></tr>
<tr><td>3)
Familiar with and able to follow guidance in BS 8213-4:2007 - Windows, doors and roof lights. Code of practice for the survey and installation of windows and external door sets.</td></tr>
<tr><td rowspan="5">R.3</td><td rowspan="5">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="4">• Contributing to the work of others (e.g. reducing wastage of resources, obtaining and providing information and developing and maintaining good working relationships).
• Handling materials effectively, such as their location and position
• Processing products and materials by shaping (e.g. preparing products and materials for processing, shaping products and materials during processing)
• Confirming installation requirements (e.g. collecting information on installation requirements, checking specifications of the installation).
• Preparing for the installation of glass supporting systems</td><td>1)
GQA Level 2 NVQ Diploma in Fenestration installations (QCF)</td></tr>
<tr><td>2)
Member of a Competent Person Scheme</td></tr>
<tr><td>3)
Familiar with and able to follow guidance in BS 8213-4:2007 - Windows, doors and roof lights. Code of practice for the survey and installation of windows and external door sets.</td></tr>
<tr><td>4)</td></tr>
</table>

		(e.g. preparing work sites, equipment and materials for work on glass supporting systems and preparing apertures for glass supporting systems including removing components and materials from apertures, restructuring or creating apertures and providing new surface finishes). • Installing glass supporting systems (e.g. positioning and securing glass supporting systems and completing the installation of glass supporting systems). • Installing window and door units in glass supporting systems (e.g. preparing and positioning windows and door units, securing window and door units in glass supporting systems, reinstating surface finishes, fixtures and fittings and completing installation of window and door units). • Installing panels into glass supporting systems (e.g. securing panels into glass supporting systems, completing installation of panels). • Maintaining glass supporting systems (e.g. dismantling glass supporting systems, maintaining installations and reinstating glass supporting systems).	Familiar with and able to follow guidance within the GGF publication – *A guide to good practice in the surveying, installation and use of replacement windows and doors for dwellings within England and Wales*
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: • Controlling the installation of windows and doors • Identifying and confirming the installation requirements in glass related works • Improving the work of the organisation through the use of	1) GQA Level 3 NVQ Diploma in Fenestration installations (QCF)
			2) Member of a Competent Person Scheme

		resources, communication and working relationships in glass or glass related work environments • Identifying and rectifying technical problems in glass or glass related working environments • Effectively removing and installing windows and doors, and particularly bay windows, sash windows, oriel windows and roof light windows. • Effectively maintaining and repairing windows and doors • Controlling the installation of windows and doors • Assess the quality of materials and components in the glass or glass related environments • Ensuring resources are available to meet the work requirements in a glass or glass related working environments • Installing glass and / or panels into windows and doors • Ensuring that after the installation is complete, the customer is satisfied with the work	3) Familiar with and able to follow guidance in BS 8213-4:2007 - *Windows, doors and roof lights. Code of practice for the survey and installation of windows and external door sets.*
R.4	Current Competency	≤5 years	
R.5	Competence Ratio	On an installation site there will be one or more specialist operative workers with a team of operatives who can work under supervision.	
R.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	Building Regulation compliance certificate	
R.7	Health and safety considerations	Location specific instruction to the installation team and occupants of the building, including PPE and working at heights requirements. *NOTE to R.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*	

Version 2

<table>
<tr><td colspan="2">Measure</td><td colspan="2">Energy efficient glazing and doors</td></tr>
<tr><td colspan="2">Product Category</td><td colspan="2">Energy efficient glazing and doors</td></tr>
<tr><td>R.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">• The requirements or guidance given in product manufacturers instructions
• The requirements in BS 8213-4:2007 Windows, doors and rooflights. Code of practice for the survey and installation of windows and external doorsets
• The guidance Glass and Glazing Federation (GGF) publication – A guide to good practice in the surveying, installation and use of replacement windows

NOTE to R.1 Attention is drawn to the need for all energy efficient glazing and doors work to comply with the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, conservation of fuel and power. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.</td></tr>
<tr><td rowspan="4">R.2</td><td rowspan="4">Surveyor competence requirements</td><td>Competence requirements</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="3">The competence requirements as stated in QCF qualification 501/2109/1 GQA Level 3 NVQ Certificate in Fenestration Surveying (QCF)

In addition, any product specific training and/or competence requirements specified by the product manufacturer.</td><td>1)
Relevant QCF qualifications/qualification units and on-site inspection of work. For example QCF qualification 501/2109/1</td></tr>
<tr><td>2)
Completion of other aligned and accepted training and certification and on-site inspection of work</td></tr>
<tr><td>3)
Membership of a Building Regulations Competent Person Scheme and on-site inspection of work</td></tr>
<tr><td></td><td></td><td>4)
Knowledge assessment and on-site assessment undertaken</td></tr>
</table>

			against a UKAS Accredited Certification Body in relation to the competences stated in Annex EEGD 1
R.3	Operative threshold competence requirements	Competence requirements	Route(s) to competence
		No specific threshold requirements	Not applicable
	Operative specialist competence requirements	Competence requirements	Route(s) to competence
		The competence requirements as defined in the following Common Minimum Technical Competence Annexe(s) where applicable to the scope of work undertaken: Annex EEGD 1 - Install energy efficient glazing and doors. Annex EEGD 1 to be derived from and cross-referenced to, the following QCF qualifications: GQA Level 2 NVQ Diploma in Fenestration Installation (QCF) GQA Level 3 NVQ Diploma in Fenestration Installation (QCF) In addition, any product specific training and/or competence requirements specified by the product manufacturer.	As defined within Common Minimum Technical Competence Annex EEGD 1 to include the following route options:
			1) Relevant QCF qualifications/qualification units + on-site inspection of work. For example QCF qualification 500/7825/2 501/1688/5
			2) Completion of other aligned and accepted training and certification + on-site inspection of work
			3) Membership of a Building Regulations Competent Person Scheme + on-site inspection of work
			4) Knowledge assessment and on-site assessment undertaken against a UKAS Accredited Certification Body in relation to the competences stated in Annex EEGD 1
R.4	Current Competency	Currency of competency in accordance with R.2 and R.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in R.2 and R.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE to O.4: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS*	

		accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.
R.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section R.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
R.6	Measure specific Information to be provided to the system end user in accordance with 4.12	• Any manufacturer or product data or information sheets • Information relating to the use of any safety and/or security features • Information relating to cleaning of the products installed • Installation guarantee document or Information to inform the end user of what guarantee documents will be provided and by whom.
R.7	Health and safety considerations	Attention is drawn to the need for all energy efficient glazing and doors work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc Act 1974. *NOTE to R.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex S (normative)
Lighting Fittings

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Lighting Fittings annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Lighting Fittings, taking account of the expert view submitted during this review.

Version 1

S.1 Additional installation requirements

When installing lighting fittings, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section S.1 of Table S.1 taking account of the health and safety considerations identified at S.7 and Annex AA.

S.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of lighting fittings, the installer shall employ or contract only a surveyor meeting the competence requirements of S.2 of Table S.1.

S.3 Operative competence

When installing lighting fittings, the installer shall employ or contract only operatives meeting the competency requirements set out in S.3 and S.4 of Table S.1 at the competency ratio specified in S.5.

S.4 Provision of information in respect of lighting fittings

At the time of handover of the lighting fittings to the customer, the installer shall ensure that the information identified at S.6 of Table S.1 is provided to the customer as part of the handover process required in **4.12.** .

Table S.1 – Measure specific requirements for lighting fittings

Measure	Lighting Fittings
Product Category	Luminaires

<table>
<tr><td>S.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The installer is responsible for
(Domestic) following the working instructions derived from Competent Person Schemes under 'Part P' of the Building Regulations for England and Wales, the Scottish Scheme for Certification of Construction and the Northern Irish equivalent.
(Domestic) Following the guidance specified in:
EAL or City & Guilds Applicable Building Regulations for Domestic Electrical Installation
ECA Part L of the Building Regulations Explained
(Non-domestic) following the working instructions derived from a UK recognised industry certification scheme in accordance with the Electrotechnical Assessment Specification (EAS).</td></tr>
<tr><td rowspan="4">S.2</td><td rowspan="4">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="3">• Knowledge and understanding of the England and Wales Building Regulations Part L (or other regulations as equivalent).</td><td>1)
Level 3 NVQ Diploma in Installing Electrotechnical systems and equipment (building structures and the environment)
(if non-domestic, with evidence of relevant core experience, knowledge and understanding of lighting and evidence of CPD).</td></tr>
<tr><td>2)
Member of a Competent Person Scheme or Member of a UK recognised industry certification scheme in accordance with the EAS.</td></tr>
<tr><td>3)
Formal electrical apprenticeship/training in line with the requirements of the EAS document and/or the ECS card.</td></tr>
<tr><td rowspan="3">S.3</td><td rowspan="2">Operative threshold competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td>• Knowledge and understanding of the England and Wales Building Regulations Part L (or other regulations as equivalent).</td><td>Level 3 NVQ Diploma in Installing Electrotechnical systems and equipment (building structures and the environment).
With a minimum 2 years core experience plus relevant understanding of lighting technology, with CPD evidence.</td></tr>
<tr><td>Operative specialist</td><td>Competence required</td><td>Route(s) to competence</td></tr>
</table>

	competence requirements	• Knowledge and understanding of the England and Wales Building Regulations Part L (or other regulations as equivalent). • Minimum of two years core experience • Relevant understanding of lighting technology	1) Level 3 NVQ Diploma in Installing Electrotechnical systems and equipment (building structures and the environment) • (Domestic) with a minimum two years experience in domestic lighting solutions, with CPD evidence. • (Non-domestic) with a minimum two years experience in lighting design requirements, with CPD evidence.
			2) Member of a Competent Person Scheme or Member of a UK recognised industry certification scheme in accordance with the EAS
S.4	Current Competency	Currency of competency in accordance with S.2 and S.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in S.2 and S.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
S.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section S.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
S.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	Specific information regarding the installed luminaires, record drawings of the installation plus associated data sheets and operating and maintenance instructions.	
S.7	Health and safety considerations	*NOTE to S.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote*	

		health and safety in the workplace.

Version 2

Measure		Lighting Fittings	
Product Category		Lighting Fittings	
S.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTES to S.1 Attention is drawn to the need, where relevant, for all lighting fittings installation work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; fire safety; resistance to moisture; sound insulation, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V* *ii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
S.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section S.3 of Table S.1	As defined under Section S.3 of Table S.1
S.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		The competence requirements stated in Table 4a of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) are mandatory. In addition, where relevant to the scope of the work being undertaken, the competences as defined in Table 4b of the IET Electrotechnical Assessment Specification For Use By Certification And Registration Bodies (January 2012 version or later subsequent version) are required.	As defined within Table 4a and 4b of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version).
	Operative specialist competence requirements	Competence required	Route(s) to competence
		Competence as specified for threshold operatives with no additional requirements.	Not applicable

S.4	Current Competency	Currency of competency in accordance with S.2 and S.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in S.2 and S.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*
S.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section S.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
S.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written information** • Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days) • A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations) • Any manufacturer or product data or information sheets • Product warranty information and guarantees **Verbal information and/or demonstration** • An explanation of the purpose and relevance written information • Demonstration of how to undertake user maintenance & cleaning (if applicable)
S.7	Health and safety considerations	Attention is drawn to the need for all lighting fittings installation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work Act 1974. *NOTE to S.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex T (normative)
Lighting Controls (Non-domestic)

NOTE: In developing the content of the PAS 2030 measure specific annexes the Technical Author with the support of the technical experts on the Steering Group, has sought to produce a single set of requirements for each measure that reflects the range of approaches currently in use. For the Lighting Controls annex in this review draft however, this has not proved possible and as a result this annex reflects two distinct approaches, (Version 1 and Version 2). These are made available for review and comment with no prior decision as to which, if any, version is to be preferred. Subsequent to the review, the Steering Group will complete the development of a single measure specific annex for Lighting Controls, taking account of the expert view submitted during this review.

Version 1

T.1 Additional installation requirements

When installing lighting controls (non-domestic), in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section T.1 of Table T.1 taking account of the health and safety considerations identified at T.7 and Annex AA.

T.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of lighting controls (non-domestic), the installer shall employ or contract only a surveyor meeting the competence requirements of T.2 of Table T.1.

T.3 Operative competence

When installing lighting controls (non-domestic), the installer shall employ or contract only operatives meeting the competency requirements set out in T.3 and T.4 of Table T.1 at the competency ratio specified in T.5.

T.4 Provision of information in respect of lighting controls (non-domestic)

At the time of handover of the lighting controls (non-domestic) to the customer, the installer shall ensure that the information identified at T.6 of Table T.1 is provided to the customer as part of the handover process required in **4.12.**

Table T.1 – Measure specific requirements for lighting controls (non-domestic)

Measure	Lighting Controls (non-domestic)
Product Category	Lighting Controls (non-domestic)

<table>
<tr><td>T.1</td><td>Additional installation requirements to those in the core of this PAS (sections 4 to 7).</td><td colspan="2">The installer is responsible for
• Following the working instructions derived from a UK recognised industry certification scheme in accordance with the Electrotechnical Assessment Specification (EAS).</td></tr>
<tr><td rowspan="5">T.2</td><td rowspan="5">Surveyor competence requirements</td><td>Competence required</td><td>Route(s) to competence</td></tr>
<tr><td rowspan="4">• Knowledge and understanding of the England and Wales Building Regulations Part L (or other regulations as equivalent).</td><td>1)
Level 3 NVQ Diploma in Installing Electrotechnical systems and equipment (building structures and the environment)
With relevant core experience and understanding of energy efficiency technologies and solutions and evidence of CPD</td></tr>
<tr><td>2)
Member of a UK recognised industry certification scheme in accordance with the EAS</td></tr>
<tr><td>3)
Formal electrical apprenticeship/training in line with the requirements of the EAS document and/or the ECS card.</td></tr>
<tr><td>4)
Other qualifications:
• LET Diploma in Lighting
• CIBSE/SoLL Lighting Diploma
• LIF Certificate or Advanced certificate
• ILE Diploma</td></tr>
</table>

			5) Other courses: • Part L for Energy Supervisor's course. • ECA/Carbon Trust Energy Effective Lighting Workshop • LIF Lighting Controls Course • Manufacturer equivalents
T.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		• Knowledge and understanding of the England and Wales Building Regulations Part L (or other regulations as equivalent).	1) Level 3 NVQ Diploma in Installing Electrotechnical systems and equipment (building structures and the environment) With a minimum of two years core experience plus a relevant understanding of lighting technology and evidence of CPD.
			2) Formal electrical apprenticeship/training in line with the requirements of the EAS document and/or the ECS card.
			3) Other courses: • ECA Introduction to Interior Lighting course (or equivalent)
	Operative specialist competence requirements	Competence required	Route(s) to competence
		• Knowledge and understanding of the England and Wales Building Regulations Part L (or other regulations as equivalent).	1) Level 3 NVQ Diploma in Installing Electrotechnical systems and equipment (building structures and the environment) With a minimum two years experience working as a design / controls systems engineer plus relevant understanding of lighting control systems and solutions. Knowledge of sensors, dimming, ballast units for different types of lamps and LEDs, and lighting levels required for buildings, with

			CPD evidence.
			2) Member of a UK recognised industry certification scheme in accordance with the EAS
			3) Formal electrical apprenticeship/training in line with the requirements of the EAS document and/or the ECS card. Together with one of the following qualifications: • LET Diploma in Lighting • CIBSE/SoLL Lighting Diploma • LIF Certificate or Advanced certificate • ILE Diploma
T.4	Current Competency	Currency of competency in accordance with T.2 and T.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in T.2 and T.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
T.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section T.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
T.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	Specific information regarding the installed control devices/systems, record drawings of the installation plus associated data sheets, operating and maintenance instructions and commissioning documentation.	

T.7	Health and safety considerations	*NOTE to T.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Version 2

Measure		Lighting Controls (non-domestic)	
Product Category		Lighting Controls (non-domestic)	
T.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTES to T.1 Attention is drawn to the need, where relevant, for all lighting control system work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; fire safety; resistance to moisture; sound insulation, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.* *ii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
T.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section T.3 of Table T.1	As defined under Section T.3 of Table T.1
T.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		The competence requirements stated in Table 4a of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) are mandatory. In addition, where relevant to the scope of the work being undertaken, the competences as defined in Table 4b of the IET Electrotechnical Assessment Specification For Use By Certification And Registration Bodies (January 2012 version or later subsequent version) are required.	As defined within Table 4a and 4b of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version).
	Operative specialist	Competence required	Route(s) to competence

	competence requirements	Competence as specified for threshold operatives with no additional requirements.	Not applicable
T.4	Current Competency	Currency of competency in accordance with T.2 and T.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in T.2 and T.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
T.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section T.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
T.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written information** • Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days) • A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations) • Any manufacturer or product data or information sheets • Product warranty information and guarantees **Verbal information and/or demonstration** • An explanation of the purpose and relevance written information • Demonstration of how to undertake user maintenance & cleaning (if applicable)	
T.7	Health and safety considerations	Attention is drawn to the need for all lighting controls installation work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc.	

		Act 1974. *NOTE to T.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex U (normative)
Ground and Air Source Heat Pumps

U.1 Additional installation requirements

When installing Ground and Air Source Heat Pumps, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section U.1 of Table U.1 taking account of the health and safety considerations identified at U.7 and Annex AA.

U.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of Ground and Air Source Heat Pumps, the installer shall employ or contract only a surveyor meeting the competence requirements of U.2 of Table U.1.

U.3 Operative competence

When installing Ground and Air Source Heat Pumps, the installer shall employ or contract only operatives meeting the competency requirements set out in U.3 and U.4 of Table U.1 at the competency ratio specified in U.5.

U.4 Provision of information in respect of ground and air source heat pumps

At the time of handover of Ground and Air Source Heat Pumps, to the customer, the installer shall ensure that the information identified at U.6 of TableU.1 is provided to the customer as part of the handover process required in **4.12.**

Table U.1 – Measure specific requirements for ground and air source heat pumps

Measure		Ground and Air Source Heat Pumps
Product Category		Ground and Air Source Heat Pumps
U.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTES to U1: Attention is drawn to the need, where relevant, for all ground or air source heat pump system installation work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, hot water safety, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern*

		Ireland is provided in Technical Booklets C-V. *ii. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: prevention of contamination of the wholesome water supply, energy conservation, safe operation, testing and commissioning* *iii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)* *iv. The Fluorinated Greenhouse Gases Regulations 2009 or subsequent updated or replacement regulations. In particular, attention is drawn to the need to comply with company and personnel certification requirements within the regulations.*	
U.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section U.3 of Table U.1	As defined under Section U.3 of Table U.1
U.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation(Domestic) 10B – Wet' central heating systems installation (under-floor) 10C - 'Wet' central heating systems installation(Non-domestic) 13A - Energy Efficiency for domestic heating and hot water 13B - Energy Efficiency for non-domestic heating and hot water Common minimum Technical Competences Annexes 2A, 6A, 9A,	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		9B, 9C, 10A, 10B, 10C, 13A and 13B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems In additional, all air and ground source heat pump system electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8).	
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: The competence requirements defined in Common Minimum Technical Competence Annex 11 – Minimum Competence for Heat Pump Systems (non-refrigerant circuits). Common Minimum Technical Competence Annex 11 has been	As defined in Common Minimum Technical Competence Annex 11

		developed by SummitSkills in consultation with the Building Services Engineering sector with the Building Regulations Competent Person Forum and the Microgeneration Certification Scheme, and has been derived from, and is cross-referenced to, the following SummitSkills National Occupational Standards for Environmental Technologies: • SUMMES8 Identify Systems, Equipment and Components. • SUMEVTS 1 Plan for Environmental Technology Systems, Equipment and Components • SUMEVTS 2 Install Environmental Technology Systems, Equipment and Components • SUMEVTS 3 Test Environmental Technology Systems, Equipment and Components • SUMEVTS 4 Commission Environmental Technology Systems, Equipment and Components	
U.4	Current Competency	Currency of competency in accordance with U.2 and U.3 shall be reconfirmed at 12 monthly intervals.. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in U.2 and U.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
U.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section U.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
U.6	Measure specific Information to be handed-over to the customer in accordance with	**Written information** • Details of the heat loss calculations made on the building, including the value of the heat loss coefficient determined for	

	4.12.	the building, the design internal and external air temperatures and average external air temperature used for heat loss through the floor. • Details of the heat pump power output at the design ambient temperature and design emitter temperature. • For air-source systems, evidence that the energy requirements of the heat pump's defrost cycles can be met without the inclusion of a supplementary electric heater inside the design temperature range. • For bivalent installations, what proportion of the building's space heating and domestic hot water has been designed to be provided by the heat pump. • Evidence for the choice of domestic hot water cylinder (if applicable) • Details of all specific room heat losses (in W/m2); • Details of the type of emitter(s) used • Design emitter temperature based on the worst performing room • The "Temperature Star Rating" from the Heat Emitter Guide • The maximum available "Temperature Star Rating" and if the maximum is not being achieved, a statement explaining the reasons why. • An estimate of the total heating energy consumption over a year (in kWh) for space heating and domestic hot water • An estimate of the of annual energy use, system Seasonal Performance Factor and system operating costs • Details of maintenance requirements and maintenance services available • For ground-source systems, a completed ground heat exchanger design table; **Diagrammatic information** • For ground-source systems, system single line schematic plan of the ground heat exchanger layout and dimensions **Verbal information and/or demonstration** • An explanation of the purpose and relevance written and diagrammatic information • Demonstration of: ○ The procedures for verifying correct system operation. ○ What to do in case of a system failure. ○ The procedures for shutdown/isolation and start-up

		○ Maintenance & cleaning recommendations (if any)
U.7	Health and safety considerations	Attention is drawn to the need for all ground and air source heat pump work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to U.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex V (normative)
Solar Thermal

V.1 Additional installation requirements

When installing solar thermal equipment, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section V.1 of Table V.1 taking account of the health and safety considerations identified at V.7 and Annex AA.

V.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of solar thermal equipment, the installer shall employ or contract only a surveyor meeting the competence requirements of V.2 of Table V.1.

V.3 Operative competence

When installing solar thermal equipment, the installer shall employ or contract only operatives meeting the competency requirements set out in V.3 and V.4 of Table V.1 at the competency ratio specified in V.5.

V.4 Provision of information in respect of solar thermal

At the time of handover of solar thermal equipment, to the customer, the installer shall ensure that the information identified at V.6 of TableV.1 is provided to the customer as part of the handover process required in **4.12.**

Table V.1 – Measure specific requirements for solar thermal
(NB – text highlighted in yellow derives from ConstructionSkills)

Measure		Solar Thermal
Product Category		Solar Thermal
V.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTES to V1 Attention is drawn to the need, where relevant, for all Solar Thermal Domestic Hot Water System work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, hot water safety, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern*

		Ireland is provided in Technical Booklets C-V. *ii. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: prevention of contamination of the wholesome water supply, energy conservation, safe operation, testing and commissioning* *iii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
V.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section V.3 of Table V.1	As defined under Section V.3 of Table V.1
V.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation (Domestic) 13A - Energy Efficiency for domestic heating and hot water Common minimum Technical Competences Annexes 2A, 6A, 9A, 9B, 9C, 10A and 13A have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		• SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems In addition, all solar thermal hot water system electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMET 1-SUMET8).	
	Operative specialist	Competence required	Route(s) to competence

<table>
<tr><td></td><td>competence requirements</td><td>In addition to the above threshold competence, specialist operative competence based on the following is required:

The competence requirements defined in Common Minimum Technical Competence Annex 9D – Hot Water System Installation (solar heated systems)

Common Minimum Technical Competence Annex 9D has been developed by SummitSkills in consultation with the Building Services Engineering sector with the Building Regulations Competent Person Forum and the Microgeneration Certification Scheme, and has been derived from, and is cross-referenced to, the following SummitSkills National Occupational Standards for Environmental Technologies:

• SUMMES8 Identify Systems, Equipment and Components.
• SUMEVTS 1 Plan for Environmental Technology Systems, Equipment and Components
• SUMEVTS 2 Install Environmental Technology Systems, Equipment and Components
• SUMEVTS 3 Test Environmental Technology Systems, Equipment and Components
• SUMEVTS 4 Commission Environmental Technology Systems, Equipment and Components

In addition, any product specific training and/or competence requirements specified by the product manufacturer.

Further competence required:

• VR281 Install Components for Warm Roof Construction
• VR298 Install Solar Collectors to Roofs</td><td>1)

QCF281 Installing Components for Warm Roof Construction in the Workplace (Roofing Occupations)

VR281 Install Components for Warm Roof Construction (Roofing Occupations)

QCF298 Installing Solar Collectors to Roofs in the Workplace (Roofing Occupations)

VR298 Install Solar Collectors to Roofs (Roofing Occupations)</td></tr>
<tr><td></td><td></td><td></td><td>2)

As defined in Common Minimum Technical Competence Annex 9D</td></tr>
<tr><td>V.4</td><td>Current Competency</td><td colspan="2">Currency of competency in accordance with V.2 and V.3 shall be reconfirmed at 12 monthly intervals.. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in V.2 and V.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the</td></tr>
</table>

		revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*
V.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section V.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.
V.6	Measure specific Information to be handed-over to the customer in accordance with 4.12.	**Written information** • Details of the actual collector installed to include: o The manufacturer's name o Type and model numbers o Serial numbers o Total aperture area o Zero loss collector efficiency (ηo) from EN 12975 test report o Collector heat loss coefficient (a1) from EN 12975 test report • Details of the actual hot water cylinder installed to include: o The manufacturer's name o Model number o Total volume (V) o Volume of the dedicated solar volume (Vs) o Surface area of solar heat exchange coil o Surface area of any auxiliary heat exchange coils o Maximum working pressure of each heat exchange coil • A warning of the risk of bacterial growth within the hot water cylinder, how this should be controlled and if in doubt to seek specialist advice.

		• Information explaining the presence of the temperature controls in the system and their purpose in preventing scald injuries. • An explanation of any user actions (including frequency) necessary to maintain lime scale protection devices. • Where applicable, manufacturer's instructions for any combination boiler or other instantaneous water heater supplied with pre-heated water from the solar heating system. • The procedure for the safe decommissioning of the solar heating system including appropriate warnings. • Details of the methods employed to control damaging effects of freezing along with the lowest temperature these methods protect to. The method and frequency of maintaining this protection (where required) should also be stated. • All manufacturer documents and product warranties relating to any installed equipment. • A system commissioning checklist and certificate. • Details of any routine maintenance required by the user. • Installer contact details **Diagrammatic information** • An 'as fitted' system single line schematic plan of both plumbing and electrical systems - detailing all functioning components of the solar heating system up to the point of integration with back-up heat source input to storage vessel. **Verbal information and/or demonstration** • An explanation of the purpose and relevance written and diagrammatic information • Demonstration of: o The procedures for verifying correct system operation. o What to do in case of a system failure. o The procedures for shutdown/isolation and start-up o Maintenance & cleaning recommendations (if any)
V.7	Health and safety considerations	Attention is drawn to the need for all solar thermal work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to V.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex W (normative)
Solar PV

W.1 Additional installation requirements

When installing solar PV, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section W.1 of Table W.1 taking account of the health and safety considerations identified at W.7 and Annex AA.

W.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of solar PV, the installer shall employ or contract only a surveyor meeting the competence requirements of W.2 of Table W.1.

W.3 Operative competence

When installing solar PV, the installer shall employ or contract only operatives meeting the competency requirements set out in W.3 and W.4 of Table W.1 at the competency ratio specified in W.5.

W.4 Provision of information in respect of solar PV equipment

At the time of handover of the solar PV system, to the customer, the installer shall ensure that the information identified at W.6 of Table W.1 is provided to the customer as part of the handover process required in **4.12.**

Table W.1 – Measure specific requirements for solar PV systems
(NB – text highlighted in yellow derives from ConstructionSkills)

Measure		Solar PV Systems
Product Category		Solar PV Systems
W.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	i. The requirements or guidance given in product manufacturers instructions ii. Where relevant the requirements stated in BS EN 62556:2009 Grid Connected Solar Photovoltaic Systems – Minimum requirements for system documentation, tests and inspections *NOTES to W.1: Attention is drawn to the need, where relevant, for all solar PV system work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of*

		the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V. *ii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
W.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section W.3 of Table W.1.	As defined under Section W.3 of Table W.1
W.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		The competence requirements stated in Table 4a of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version). In addition, where relevant to the scope of the work being undertaken, the competences as defined in Table 4b of the IET Electrotechnical Assessment Specification For Use By Certification And Registration Bodies (January 2012 version or later subsequent version) are required. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the National Occupational Standards for Electrotechnical Services –– Building and Structures (SUMET 1- SUMET8)	As defined within Table 4a and 4b of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version).
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: The competence requirements defined in Common Minimum Technical Competence Annex 18 – Minimum Competence for Solar Photovoltaic Systems Installation Work Common Minimum Technical Competence Annex 18 has been developed by SummitSkills in consultation with the Building Services Engineering sector with the Building Regulations Competent Person Forum and the Microgeneration Certification	1) QCF281 Installing Components for Warm Roof Construction in the Workplace (Roofing Occupations) VR281 Install Components for Warm Roof Construction (Roofing Occupations) QCF298 Installing Solar Collectors to Roofs in the Workplace (Roofing Occupations) VR298 Install Solar Collectors to Roofs (Roofing Occupations)

		Scheme and has been derived from, and is cross-referenced to, the following SummitSkills National Occupational Standards for Environmental Technologies: • SUMMES8 Identify Systems, Equipment and Components. • SUMEVTS 1 Plan for Environmental Technology Systems, Equipment and Components • SUMEVTS 2 Install Environmental Technology Systems, Equipment and Components • SUMEVTS 3 Test Environmental Technology Systems, Equipment and Components • SUMEVTS 4 Commission Environmental Technology Systems, Equipment and Components Further competence required: • VR281 Install Components for Warm Roof Construction • VR298 Install Solar Collectors to Roofs	2) As defined within each Common Minimum Technical Competence Annex 18
W.4	Current Competency	Currency of competency in accordance with W.2 and W.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in W.2 and W.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
W.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section W.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
W.6	Measure specific Information to be handed-over to the customer in accordance with	**Written information** • Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate	

	4.12.	is required and will be provided within 30 days)
		• A copy of the manufacturer manuals and data sheets for:
		  o PV modules
		  o Inverter
		  o All other products for which manufacturer manuals and data sheets are provided.
		• A copy of all DNO Notification and Installation Commissioning Confirmation documentation (Grid-connected systems only)
		• A copy of the Electrical Installation Certificate in accordance with the current version of BS7671 (IET Wiring Regulations)
		• A copy of the PV System Verification Certificate in accordance with BS EN 62446:2009, Annex A
		• A copy of the PV Inspection Report in accordance with BS EN 62446:2009, Annex B
		• A copy of the PV Array Test Report in accordance with BS EN 62446:2009, Annex C
		• Table of inverter protection settings (under/over voltage, under/over frequency, etc).
		• Procedures for verifying correct system operation.
		• A checklist of what to do in case of a system failure.
		• Shutdown/isolation and start-up procedures.
		• Maintenance & cleaning recommendations (if any)
		• Considerations for any future building works adjacent to the PV array (e.g. roof works) to avoid potential damage or shading of the PV array.
		• Product warranty information and guarantees
		• An estimation of system performance calculated using procedures defined in MIS 3002 Requirements for Contractors Undertaking The Supply, Design, Installation, Set To Work Commissioning And Handover Of Solar Photovoltaic (PV) Microgeneration Systems
		Diagrammatic Information
		• A single line electrical schematic of the PV array and all system wiring up to the point of connection with the consumer unit.
		Verbal information and/or demonstration

		• An explanation of the purpose and relevance written and diagrammatic information
		• Demonstration of:
		  ○ The procedures for verifying correct system operation.
		  ○ What to do in case of a system failure.
		  ○ The procedures for shutdown/isolation and start-up.
		  ○ Maintenance & cleaning recommendations (if any)

W.7	Health and safety considerations	Attention is drawn to the need for all solar PV work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to W.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex X (normative)
Biomass Boilers

X.1 Additional installation requirements

When installing biomass boilers, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section X.1 of Table X.1 taking account of the health and safety considerations identified at X.7 and Annex AA.

X.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of biomass boilers, the installer shall employ or contract only a surveyor meeting the competence requirements of X.2 of Table X.1.

X.3 Operative competence

When installing biomass boilers, the installer shall employ or contract only operatives meeting the competency requirements set out in X.3 and X.4 of Table X.1 at the competency ratio specified in X.5.

X.4 Provision of information in respect of biomass boilers

At the time of handover of the biomass boiler, to the customer, the installer shall ensure that the information identified at X.6 of Table X.1 is provided to the customer as part of the handover process required in **4.12.**

Table X.1 – Measure specific requirements for biomass boilers

Measure		Biomass Boilers
Product Category		Biomass Boilers
X.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTES to X.1 Attention is drawn to the need, where relevant, for all biomass boiler installation work to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; fire safety; resistance to moisture; sound insulation, ventilation, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in*

		Technical Booklets C-V *ii. The Clean Air Act 1993. In particular, requirements relating to Smoke Controlled Areas and authorised fuels are highlighted.* *iii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
X.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section X.3 of Table X.1	As defined under Section X.3 of Table X.1
X.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		Where applicable to the scope of work undertaken the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 2C - Minimum Competency for Common Processes (Compressed Gas Welded Pipework Installation) 2D - Minimum Competency for Common Processes (Manual Arc Welded Pipework Installation) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation(Domestic) 10B – Wet' central heating systems installation (underfloor) 10C - 'Wet' central heating systems installation (Non-domestic) Common minimum Technical Competences Annexes 2A,2B, 2C, 2D, 6A, 9A, 9B, 9C, 10A, 10B and 10C have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		• SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES8 (M8) Identify systems, equipment and components • SUMMES9 (M9) Install domestic heating systems, equipment and components • SUMMES10 Install plumbing systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems • SUMMES30 Prepare resources for pipe jointing activities In additional, all biomass boiler electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8).	
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: Where applicable to the scope of work undertaken the competences in the following Common Minimum Technical Competence annexes are required:	As defined within Common Minimum Technical Competence Annex 5C and 5D

		5C – Biomass Combustion Appliance Installation (Domestic) 5D – Biomass Combustion Appliance Installation (Non-Domestic) Common minimum Technical Competences Annex 5C and 5D have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES7 Prepare to carry out work • SUMMES8 Identify systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems, equipment and components • SUMMES27 Commission mechanical systems	
X.4	Current Competency	Currency of competency in accordance with X.2 and X.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in X.2 and X.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE 1: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.* *NOTE 2: The Common Minimum Technical Competency Annexes 5C and 5D require renewal of qualifications/certifications at 5 yearly intervals.*	
X.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section X.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
X.6	Measure specific Information to be handed-over to the customer in accordance with	**Written Information**	

	4.12.	• Product manufacturer installation and servicing instructions
		• Product manufacturer user manuals/guides
		• Product warranty information and guarantees
		• Fuel sourcing and storage guidance
		• Commissioning certificate that meets the requirements of the Building Regulations
		• System cleaning and water treatment record (if not included in the commissioning certificate)
		• Installer details (if not included in the commissioning certificate)
		  o Mechanical
		  o Electrical
		• Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days)
		• A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations)
		Verbal information and/or demonstration
		• An explanation of the purpose and relevance the written information provided
		• An explanation of system safety features and controls and any information relating to what the end user should do in the event of the safety features and controls being activated
		• An explanation of what controls/components should not be adjusted by the system user
		• An explanation of maintenance requirements and frequency and any maintenance services available.
		• Demonstration of:
		  o How to set user controls for maximum efficiency
		  o Any safety checks that the system user should undertake
		  o Any cleaning and maintenance processes that the system user should undertake
		  o What to do in the case of an emergency or perceived emergency

X.7	Health and safety considerations	Attention is drawn to the need for all biomass boiler work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974.

		NOTE to X.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.

Annex Y (normative)
Micro CHP

Y.1 Additional installation requirements

When installing Micro CHP equipment, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section Y.1 of Table Y.1 taking account of the health and safety considerations identified at Y.7 and Annex AA.

Y.2 Surveyor competence

When undertaking a pre-installation survey in respect of the installation of Micro CHP equipment, the installer shall employ or contract only a surveyor meeting the competence requirements of Y.2 of Table Y.1.

Y.3 Operative competence

When installing Micro CHP equipment, the installer shall employ or contract only operatives meeting the competency requirements set out in Y.3 and Y.4 of Table Y.1 at the competency ratio specified in Y.5.

Y.4 Provision of information in respect of Micro CHP equipment

At the time of handover of Micro CHP equipment, to the customer, the installer shall ensure that the information identified at Y.6 of TableY.1 is provided to the customer as part of the handover process required in **4.12.**

Table Y.1 – Measure specific requirements for Micro CHP equipment

Measure		Micro-Combined Heat and Power (Natural Gas-fired and Liquefied Petroleum Gas-fired)
Product Category		Gas-fired micro-cogeneration appliances of rated thermal input not exceeding 70 kW net
Y.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions. Where relevant to the type of installation being undertaken, the requirements or guidance given in: I. BS 8660-1:2011 Gas-fired micro-cogeneration appliances of rated thermal input not exceeding 70 kW net – Part 1: Specification for selection, installation, inspection, commissioning, servicing and maintenance of Stirling engine micro-cogeneration appliances II. BS 6891:2005+A2:2008, Installation of low pressure gas pipework of up to 35 mm (R1 1/4) in domestic premises (2nd family gas). Specification III. BS 5440-1: 2008, Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family

		gases) – Part 1: Specification for installation of gas appliances to chimneys and for maintenance of chimneys. IV. BS 5440-2: 2009, Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) – Part 2: Specification for the installation and maintenance of ventilation provision for gas appliances. V. BS EN 14366:2004 including Corrigendum January 2009 Heating systems in buildings – Installation and commissioning of water based systems VI. BS 7593:2006, Code of practice for treatment of water in domestic hot water central heating systems VII. Energy Networks Association Engineering Recommendation G83/1-1 Recommendations for the Connection of Small-scale Embedded Generators (up to 16 A per phase) in Parallel with Public Low-voltage Distribution Networks VIII.IGEM/UP/2, Edition 2, Installation of pipework on industrial and commercial premises IX. UKLPG, Code of Practice 22, LPG Piping System Design and Installation *NOTES to Y.1: Attention is drawn to the need, where relevant, for all gas-fired micro-cogeneration appliance installation work to comply with:* *i. the current The Gas Safety (Installation and Use) Regulations that apply in the UK country or locality in which the installation is being carried out. The Gas Safety (Installation and Use) Regulations have requirements relating to both technical gas safety standards and qualification and supervision of persons carrying out gas work* *ii. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation, hot water safety, heat producing appliances, conservation of fuel and power and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.* *ii. the Electrical Safety, Quality and Continuity Regulations 2002 , in particular, Regulation 22 is highlighted* *iv. the current Water Supply (Water Fittings) Regulations or Water Byelaws that apply in the UK country in which the installation is being carried out.* *v. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*	
Y.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section Y.3 of Table Y.1	As defined under Section Y.3 of Table Y.1
	Operative threshold	Competence required	Route(s) to competence

Y.3	competence requirements	Where applicable to the scope of work undertake the competences in the following Common Minimum Technical Competence annexes are required: 2A – Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Domestic) 2B - Minimum Competency for Hot Water, Cold Water and 'Wet' Heating Systems Installation Work (Non-Domestic) 6A – Backflow prevention (plumbing and heating systems) 9A – Hot water system installation (Domestic) 9B – Hot water system installation (Unvented) 9C – Hot water system installation (Non-domestic) 10A - 'Wet' central heating systems installation(Domestic) 10B – Wet' central heating systems installation (underfloor) 10C - 'Wet' central heating systems installation (Non-domestic) 13A - Energy Efficiency for domestic heating and hot water 13B - Energy Efficiency for non-domestic heating and hot water Common minimum Technical Competences Annexes 2A,2B, 6A, 9A, 9B, 9C, 10A, 10B, 10C, 13A and 13B have been derived from, and are cross-referenced to, the following SummitSkills National Occupational Standards for Mechanical Engineering Services • SUMMES1 Apply health and safety legislation and working practices • SUMMES7 Prepare to carry out work • SUMMES10 Install plumbing systems, equipment and components • SUMMES21 Install industrial and commercial H&V systems, equipment and components • SUMMES25 Inspect and test mechanical systems,	As defined within each Common Minimum Technical Competence Annex referred to in the adjacent column and where applicable, as defined in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies.

		equipment and components • SUMMES27 Commission mechanical systems In additional, all gas-fired micro-cogeneration appliance installation electrical work must be undertaken by operatives who meet the competence requirements as stated in Table 4a or 4b (as applicable) of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version) as applicable to the scope of work being undertaken. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the SummitSkills National Occupational Standards for Electrotechnical Services – Building and Structures (SUMETS1-SUMETS8). NOTE: As stated under Section Y.1 of Table Y.1, the Gas Safety (Installation and Use) Regulations have requirements relating to qualification and supervision of persons carrying out gas work. These requirements are not repeated here; however, installers are reminded of the legal obligation to meet the requirements.	
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: The competence requirements defined in Common Minimum Technical Competence Annex 12 – Minimum Technical Competency for micro-Combined Heat and Power Appliance Installation Work.	As defined within Common Minimum Technical Competence Annex 12 – Minimum Technical Competency for micro-Combined Heat and Power Appliance Installation Work
Y.4	Current Competency	Currency of competency in accordance with Y.2 and Y.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in Y.2 and Y.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE 1: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	

		NOTE 2: The currency of competency requirements stated above relate only to the competence requirements stated within this annex and do not relate to or replace the qualification and supervision requirements stated within Gas Safety (Installation and Use) Regulations.
Y.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section Y.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work. *NOTE : The on-the-job training and development competence ratio requirements stated above apply only where such activity would not be in contravention of the Gas Safety (Installation and Use) Regulations and/or any other relevant regulations. Installers are responsible for identifying and ensuring compliance with the relevant regulatory requirements.*

Y.6	Measure specific Information to be provided to the customer	**Written Information**
		• Product manufacturer installation and servicing instructions
		• Product manufacturer user manuals/guides
		• Product warranty information and guarantees
		• Benchmark commissioning certificate of other commissioning certificate that meets the requirements of the Building Regulations
		• System cleaning and water treatment record (if not included in the commissioning certificate)
		• Installer details (if not included in the commissioning certificate)
		  o Mechanical
		  o Electrical
		• Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days)
		• A copy of any electrical inspection and testing certificates that have completed to meet the requirements of Building Regulations and/or the current version of BS7671 (IET Wiring Regulations)
		• A copy of all Distribution Network Operator (DNO) Notification and Installation Commissioning Confirmation documentation

		Verbal information and/or demonstration • An explanation of the purpose and relevance the written information provided • An explanation of system safety features and controls and any information relating to what the end user should do in the event of the safety features and controls being activated • An explanation of what controls/components should not be adjusted by the system user • An explanation of maintenance requirements and frequency and any maintenance services available. • Demonstration of: o How to set user controls for maximum efficiency o Any safety checks that the system user should undertake o What to do in the case of an emergency or perceived emergency
Y.7	Health and safety considerations	Attention is drawn to the need for all micro CHP work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to Y.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex Z (normative)
Micro and Small Scale Wind Turbine Systems

Z.1 Additional Installation Requirements

When installing micro and small scale wind turbine systems, in addition to meeting the core requirements set out in clauses 4, 5, 6 and 7 of this PAS the installer shall also work to any standards, specifications, instructions or guidance identified in section Z.1 of Table Z.1 taking account of the health and safety considerations identified at Z.7 and Annex AA.

Z.2 Surveyor Competence

When undertaking a pre-installation survey in respect of the installation of micro and small scale wind turbine systems, the installer shall employ or contract only a surveyor meeting the competence requirements of Z.2 of Table Z.1.

Z.3 Operative Competence

When installing micro and small scale wind turbine systems, the installer shall employ or contract only operatives meeting the competency requirements set out in Z.3 and Z.4 of Table Z.1 at the competency ratio specified in Z.5.

Z.4 Provision of Information in respect of micro and small scale wind turbine systems

At the time of handover of the micro and small scale wind turbine system, to the customer, the installer shall ensure that the information identified at Z.6 of Table Z.1 is provided to the customer as part of the handover process required in **4.12.**

Table Z.1 – Measure Specific Requirements for micro wind

Measure		Micro and Small Scale Wind Turbine Systems
Product Category		Grid-connected Micro and Small Scale Wind Turbine Systems within the power output range 500W to 25kW, off-grid battery systems, off-grid direct connected systems
Z.1	Additional installation requirements to those in the core of this PAS (sections 4 to 7).	The requirements or guidance given in product manufacturers instructions *NOTES to Z.1: Attention is drawn to the need, where relevant, for all micro and small scale wind turbine systems to comply with:* *i. the current Building Regulations that apply in the UK country in which the installation is being carried out. In particular, compliance in relation to the following aspects is highlighted: workmanship; materials; structural stability; fire safety; resistance to moisture; sound insulation and electrical safety. Further guidance on the requirements of the Building Regulations in England and Wales is provided in Approved Documents A-P and Workmanship and Materials. Further guidance on the requirements of the Building Regulations in Scotland is provided in the Domestic Technical Handbook and Non-Domestic Technical Handbook. Further guidance on the requirements of the Building Regulations in Northern Ireland is provided in Technical Booklets C-V.* *ii. the current edition of the Institution of Engineering and Technology (IET) Wiring Regulations (BS7671)*

Z.2	Surveyor competence requirements	Competence required	Route(s) to competence
		As defined under Section Z.3 of Table Z.1.	As defined under Section Z.3 of Table Z.1
Z.3	Operative threshold competence requirements	Competence required	Route(s) to competence
		The competence requirements stated in Table 4a of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version). In addition, where relevant to the scope of the work being undertaken, the competences as defined in Table 4b of the IET Electrotechnical Assessment Specification For Use By Certification And Registration Bodies (January 2012 version or later subsequent version) are required. The IET Electrotechnical Assessment Specification assessment specification is wholly based upon and requires alignment to the National Occupational Standards for Electrotechnical Services -– Building and Structures (SUMET1- SUMET8).	As defined within Table 4a and 4b of the IET Electrotechnical Assessment Specification for use by Certification And Registration Bodies (January 2012 version or later subsequent version).
	Operative specialist competence requirements	Competence required	Route(s) to competence
		In addition to the above threshold competence, specialist operative competence based on the following is required: The competence requirements defined in Common Minimum Technical Competence Annex 19 – Minimum Competence for Wind Turbine Systems Installation. Common Minimum Technical Competence Annex 19 has been developed by SummitSkills in consultation with the Building Services Engineering sector with the Building Regulations Competent Person Forum and the Microgeneration Certification Scheme and has been derived from, and is cross-referenced to, the following SummitSkills National Occupational Standards for Environmental Technologies: • SUMMES8 Identify Systems, Equipment and Components.	As defined within Common Minimum Technical Competence Annex 19 – Wind Turbine Systems Installation

		• SUMEVTS 1 Plan for Environmental Technology Systems, Equipment and Components • SUMEVTS 2 Install Environmental Technology Systems, Equipment and Components • SUMEVTS 3 Test Environmental Technology Systems, Equipment and Components • SUMEVTS 4 Commission Environmental Technology Systems, Equipment and Components	
Z.4	Current Competency	Currency of competency in accordance with Z.2 and Z.3 shall be reconfirmed at 12 monthly intervals. Reconfirmation of competence shall be through both examination of personnel records and inspection of work carried out on-site. Where safety critical or technical critical revisions are made to the competency requirements in Z.2 and Z.3, including any revisions to the cross-referenced documents, installers shall meet the requirements of the revisions within the time period stated at the time the revisions are introduced. *NOTE: The time period for meeting the requirements of the revisions should be set in consultation with the UKAS accredited certification body(ies) and take account of the nature and level of risk associated with the reason(s) for the revisions.*	
Z.5	Competence Ratio	Where on-the-job training and development is undertaken, the maximum competent person/trainee ratio is 1:2 Where the on-the-job training and development of operatives who do not meet the full competence requirements stated under Section Z.3 above is undertaken any such training and development shall be conducted on a fully supervised basis and the supervision shall be directly and solely undertaken by a person that meets the full competence requirements for that aspect of the work. The person undertaking the direct supervision shall be on-site at the installation location for the duration of any training and development activity and shall inspect all work undertaken in a training and development situation and confirm the compliance of all such work.	
Z.6	Measure specific Information to be provided to the customer	**Written information** • Building Regulations compliance certificate (or information explaining that a Building Regulations compliance certificate is required and will be provided within 30 days) • A copy of the manufacturer manuals and data sheets • A copy of all DNO Notification and Installation Commissioning Confirmation documentation (Grid-connected systems only) • A copy of the Electrical Installation Certificate in accordance with the current version of BS7671 (IET Wiring Regulations) • A checklist of what to do in case of a system failure. • Shutdown/isolation and start-up procedures.	

		• Maintenance & cleaning recommendations (if any) • Product warranty information and guarantees • An estimation of system performance calculated using procedures defined in MIS 3003 Requirements for Contractors Undertaking The Supply, Design, Installation, Set To Work Commissioning And Handover Of Micro and Small Wind Turbine Systems **Verbal information and/or demonstration** • An explanation of the purpose and relevance written and diagrammatic information • Demonstration of: o The procedures for verifying correct system operation. o What to do in case of a system failure. o The procedures for shutdown/isolation and start-up. o Maintenance & cleaning recommendations (if any)
Z.7	Health and safety considerations	Attention is drawn to the need for all micro and small scale wind turbine systems work to be undertaken in a manner that is compliant with the Health and Safety at Work etc. Act 1974 and all relevant regulations that are enabled under the Health and Safety at Work etc. Act 1974. *NOTE to Z.7 Statutory regulations set out responsibilities for health and safety issues in all places of work. Annex AA provides a set of questions the consideration of which will prompt installers and operatives to establish working practices that will promote health and safety in the workplace.*

Annex AA (informative)
Health and safety considerations

AA.1 Use of the health and safety questionnaire

Installers may find it helpful to review and respond to the questions provided in Table AA.1 in order to self-assess their provisions for health and safety. The completed table may also be of assistance in preparing for assessment of their application of PAS 2030. The table may be copied and used as required.

Table AA.1 – Health and safety questionnaire for installer self assessment purposes

Q. Ref.	Core Question	Example of the type of information in support of responses, which will be taken into account in assessment	YES	NO	Unique reference to supporting information.
AA.1	**Are you able to demonstrate that you have a policy and organisation for health and safety (H&S) management?**	Be able to provide evidence of an H&S policy endorsed by the most senior manager, that is regularly reviewed. The policy should be relevant to the nature and scale of the work and set out responsibilities for H&S management at all levels in the organization. Note: organisations with less than five operatives are not required by law to have a documented policy statement.			
AA.2	**Are you able to demonstrate arrangements for ensuring that your H&S measures are effective in reducing/ preventing incidents, occupational ill-health and accidents?**	Be able to provide details of the arrangements for H&S management that are relevant to the nature and scale of the work undertaken. These should set out how the Installer will discharge its duties with a clear indication of how these arrangements are communicated to the workforce			

AA.3	**Do you have access to competent H&S advice/assistance – both general and construction sector related?**	Be able to provide evidence of how your organization obtains access to competent H&S advice, including for operatives (Access to competent in-house advice, in whole or part, is preferred). It is essential that the advisor(s) be able to provide general H&S advice and that (from the same source or elsewhere) advice relating to measure specific H&S issues is accessible as required.			
AA.4	**Do you have a policy and process for providing your operatives with training and information appropriate to the type of work for which your organization is likely to bid?**	Be able to provide evidence that your organization has in place and implements, training arrangements to ensure that its operatives have sufficient skills and understanding to discharge their various duties. This should include a programme of refresher training (e.g. a CPD programme) that will keep operatives updated on legislation and good H&S practice applicable throughout the company.			
AA.5	**Do your operatives have H&S or other relevant qualifications and experience sufficient to implement your H&S policy to a standard appropriate to the work for which your organization is likely to bid?**	Be able to demonstrate that your operatives possess suitable qualifications and experience for the tasks assigned to them, unless there are specific situations where they need to work under controlled and competent supervision e.g trainees.			
AA.6	**Do you check, review and where necessary improve your H&S performance?**	Be able to provide evidence that your organization has in place and implements, a system for monitoring H&S procedures on an ongoing basis and for periodically reviewing and updating that system as necessary.			
AA.7	**Do you have procedures in place to involve your operatives in the planning and implementation of H&S measures?**	Be able to provide evidence that your organization has in place and implements a means of involving and engaging with its operatives on H&S matters and show how operative comments, including complaints are taken into account.			

AA.8	**Do you conduct accident/incident reporting and undertake follow-up investigation?**	Be able to provide access to all records of RIDDOR-reportable events which should include accident rates and frequency, for at least the last three years. Demonstrate that your organization has in place a system for reviewing accidents, incidents and near misses, and recording action taken as a result including action taken in response to enforcement.			
AA.9	**Do you have arrangements for ensuring that your sub-contractors apply H&S measures to a standard appropriate to the work for which they are being engaged?**	Be able to demonstrate that your organization has and implements, arrangements for monitoring subcontractor's H&S procedures and for ensuring that H&S performance appropriate for the work to be undertaken is delivered throughout the whole of your organizations supply chain.			
AA.10	**Do you operate a process of risk assessment capable of supporting safe methods of work and reliable project delivery where necessary?**	Be able to demonstrate that your organization has in place and implements procedures for carrying out risk assessments and for developing and implementing location or job specific safe systems of work ('method statements'). Be able to provide relevant indicative examples. The identification and control of any significant occupational health issues should be prominent. *NOTE Organisations with five or less employees are not required by law to record risk assessments but still have a legal duty to provide safe systems of work.*			
AA.11	**Do you have arrangements for co-operating and co-ordinating your work with others working at the same location?**	Please provide explanation of how co-operation and co-ordination of the work is achieved in practice, and how other organisations are involved in drawing up method statements/safe systems of work etc. including arrangements for response to emergency situations. This should include details of how comments and input from your subcontractors will be taken into account and how external comments including any complaints, will be responded to.			

AA.12	**Do you have arrangements for ensuring that on-site welfare provision meets legal requirements and the needs/expectations of your operatives?**	Be able to demonstrate how your organization ensures that suitable welfare facilities will be in place before starting work at a new location, whether provided by site-specific arrangement or own organizational measures. *NOTE The Construction (design and management) Regulations 2007 (CDM): schedule 2 sets out the legal requirements for welfare. Every construction project or building job, no matter how small, is a "CDM job".*			

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